Final Examinations of Some Governorates 2022

1 Cairo Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. In human, some traits are not transmitted from one generation to another and they are called the ..... traits.
2. The electromotive force of several similar cells connected in ..... is equal to the e.m.f. of one cell.
3. The ..... gland secretes hormone that regulate the growth and development of sex organs in human.
4. Ionic compounds reactions are ..... than that of the covalent compounds.

B Join from group (A) what suits in group (B) :

(A)	(B)
1. Used to measure the electric current intensity	a. the nucleic acid DNA.
2. Carries the hereditary traits of the living organism	b. the ammeter.
3. Used in drilling for petroleum and underground water	c. the reducing agent.
4. The substance which loses one or more electrons during a chemical reaction	d. the nuclear energy.

C What happens when ... ?

Adding silver nitrate solution to sodium chloride solution.

Question 2

A Correct the underlined words :

1. Sodium metal reacts with water producing sodium hydroxide and **oxygen** gas evolves.
2. E.m.f. of battery made up of cells connected in series equal **multiplication** of e.mf. of these cells.
3. Speed up the chemical reaction by using catalysts is called a **negative** catalysts.
4. The living organism that carries two similar factors is called **hybrid** individual.

B Choose the odd word from the following :

1. Radium – Uranium – Magnesium – Cesium.
2. Products' volume – Reactants' concentration – Temperature – Catalysts.
3. Ampere – Volt – Ohmmeter – Ohm.
4. Potassium – Gold – Sodium – Calcium.

C Explain on genetic bases :

The properties of the produced generation from mating between two individuals both have hybrid curly hair. (knowing that the curly hair gene symbolized by B and smooth hair gene symbolized by b)

Question 3

A Write the scientific term of each of the following sentences :

1. The change in the concentration of the reactants and products at unit time.
2. The opposition that the electric current faces during its passage through a conductor.
3. Organs secrete hormones directly in the blood stream.
4. The state of an electric conductor that shows the transfer of the electricity from or to it, when it is connected to another conductor.

B To who these works related ?

1. The founder of heredity.
2. Discovered the relation between current intensity and potential difference.
3. The discovery of the radioactivity phenomenon.
4. Discovered the means of how the gene controls the appearance of a trait.

C If the work done to transfer a charge of 200 coulomb between two points is 22000 joules.

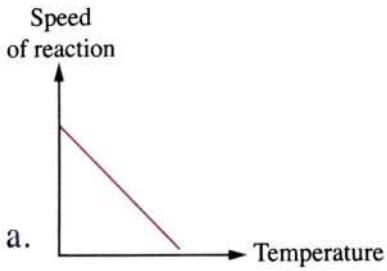
Calculate the potential difference between the two points.

Question 4

A Choose the correct answer :

1. Which of the following graphical relations represents the relation between the speed of chemical reaction and the temperature.

a.



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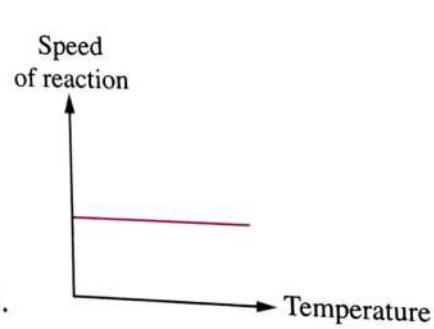

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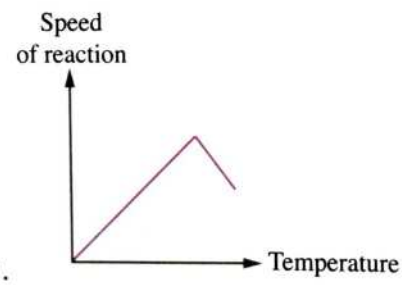

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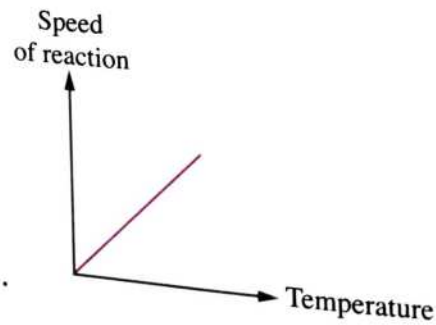
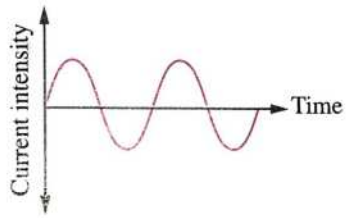


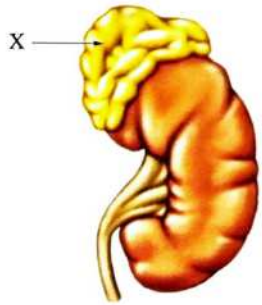
2. The instrument which is used to control the resistance in the electric circuit is .....
   a. rheostat. b. ammeter. c. voltmeter. d. ohmmeter.
3. The hereditary factors ..... when the gamets are formed, that as Mendel's first law.
   a. duplicate b. disappear c. segregate d. merge
4. Aluminium practically lates in its reaction with hydrochloric acid due to the presence of ..... layer.
   a. aluminium chloride b. aluminium oxide
   c. aluminium hydroxide d. aluminium sulphate

B Study the following figures, then answer :

1. In figure (1), the type of current is .....
2. This current produced from .....
3. In figure (2), the name of gland which the arrow (x) points to is .....
4. The name of hormone that is secreted by this gland is .....



(1)



(2)

C In the following reaction :

$2Na + Cl_2 \longrightarrow 2NaCl$

Explain by equations the oxidation and reduction that occur to sodium and chlorine elements.

2 Giza Governorate

Answer the following questions :

Question 1

A Put (✓) or (✗) in front of the following statements :

1. The electric current is the flow of electric positive charges through a conducting material. ( )
2. Genes control the appearance of an individual's hereditary traits. ( )
3. The nuclear wastes with strong radiation is buried at a medium depths underground. ( )
4. Mendel let the pea plants self-pollinate for several times to be sure of the purity of this trait. ( )

B Choose the correct answer :

1. The reaction between sodium chloride solution and silver nitrate solution is from ..... reactions.
   a. fast b. medium c. slow d. very slow
2. ..... is consists of two lobes which located in the front surface of the neck on both sides of the trachea.
   a. Two adrenal glands b. Pituitary gland
   c. Thyroid gland d. Pancreas gland
3. On heating ..... compound, oxygen gas is evolved.
   a. $Cu(OH)_2$ b. $CaSO_4$ c. $CuCO_3$ d. HgO
4. The hormone which responsible of the appearance of the female secondary sex characters is .....
   a. progesterone. b. testosterone. c. adrenalin. d. estrogen.

C What is meant by ... ?

The work done to transfer a quantity of charge 8 coulomb between the two poles of this conductor equal 64 Joule.

Question 2

A Write the scientific term for each of the following statements :

1. The potential difference between the two poles of the battery when the electric circuit is open.
2. The change in the concentration of the reactancts and products at a unit time.
3. The elements whose atoms' nuclei contain a number of neutrons more than the number required for its stability.
4. Chemical reactions in which one of the elements substitutes another element in a solution of one of its compounds.

B Correct the underlined words in the following statements :

1. In the reaction : $H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$, the **hydrogen** is oxidizing agent.
2. The genetic structure of a pea plant, wrinkled and green seeds is **RrYy**.
3. The number of collisions between the reactant molecules decreases with **increasing** the temperature.
4. The check dimples from the **recessive** human traits.

C What happen to the human body when the number of red blood cells decrease as a result of exposure to nuclear radiation ?

Question 3

A Complete the following sentences by suitable words :

1. The only way for the hormone to reach their sites of action is .....
2. When we connect three similar cells, the electromotive force of each one 1.5 volt in a series connection, then the electromotive force of the battery produced is equal ..... volt.
3. The decreasing of secretion of the growth hormone at the childhood causes ..... disease in the human.
4. To control in the value of electric current intensity that passes in the different parts of the electric circuit, we use ..... apparatus.

B First : Show by balanced symbolic equations the following reactions :

1. Diluted hydrochloric acid with sodium carbonate.
2. Sodium element with water.

Second : Find the odd word from the following :

1. Its flowers are hermaphrodite – Difficult to plant – Shortness in its life cycle – Easily artificially pollinated.
2. Car driving – Speaking in english language – Learning of walking in children – Skin colour.

C What is the result of ... ?

Replacing a piece of iron with iron filings of the same mass when reacting with diluted acids.

Question 4

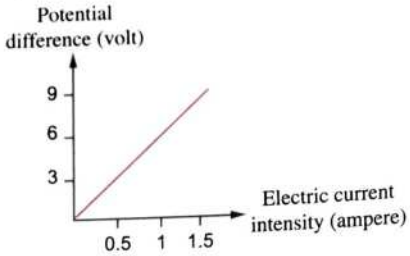
A Choose from column (B) what suitable in column (A) :

(A)	(B)
1. Medicines	a. the equivalent unit to it is joule/coulomb.
2. Electric generator	b. no chemical changes or decrease in mass occurs to it.
3. The volt	c. from the products of the chemical reactions in our life.
4. From the properties of the catalyst	d. act to change the kinetic energy into electric energy.

B Study the following figures, then answer the questions :

Fig (1)

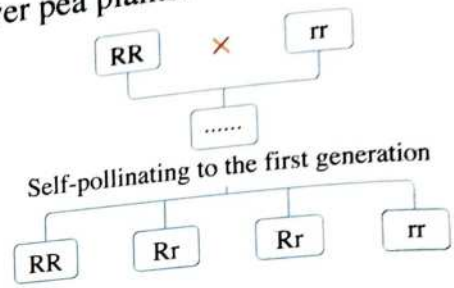
The figure represents the relation between the potential difference and electric current intensity for a conductor.



1. The value of the resistance to the conductor equals .....
2. From the relation : Conclude the resistance definition.

Fig (2)

The figure represents cross-pollination between a white flower pea plants and red a flower pea plants.



3. Determine the symbol of first generation.
4. State the reason : There is no white flower pea plants appear in the first generation.

C Explain :

When sodium reacts with the chlorine gas to form sodium chloride the oxidation and reduction process in occur, although there is no oxygen.

3 Alex. Governorate

Answer the following questions :

Question 1

A Complete the following sentences with suitable words :

1. The rate of decomposing hydrogen peroxide increases by adding ..... or a piece of .....
2. The ability to roll the tongue is from the ..... genetic traits in the human.
3. The ..... is used to measure the current intensity.

B Choose the correct answer from the following :

1. The reaction between the ions of sodium chloride with silver nitrate is the example of ..... reaction.

   a. slow b. fast c. very slow d. average

2. The ratio between the potential difference across two ends of a conductor and the current intensity that passes through it is known as .....

   a. the electromotive force. b. the quantity of electricity.

   c. the electric resistance. d. the electric current.

3. When magnesium replaces copper in its salt solution, then a..... precipitate is formed.
   a. black b. white c. red d. blue
4. The radiologist should not be exposed to a radiation dose more than ..... millisevert per year.
   a. 5 b. 10 c. 15 d. 20

C Give reasons for the following :

1. The rate of the reaction of hydrochloric acid with iron filings is faster than a piece of iron of the same mass.
2. Radiation has genetic effects.

Question 2

A Write the scientific term for each of the following :

1. A chemical process which increases oxygen percentage or decreases hydrogen percentage in substance.
2. Genetic traits that are not transmitted from one generation to another.
3. A substance which changes the rate of the chemical reaction without being changed.
4. A chemical messages that controls and organizes most of the activites and functions in the bodies of living organisms.

B In front of you in the school lab the following substance :

(Hydrochloric acid - Sodium carbonate - Silver nitrate - Sodium chloride)

How can you get :

1. White precipitate.
2. A gas turbids limewater.

(Illustrate by chemical equations only)

C What is the function for each of the following ... ?

1. The voltmeter.
2. The dynamo.

Question 3

A Correct the underlined words :

1. Mendel's second law is known as the law of **segregation of factors**.
2. From the properties of alternatig current is **constant** intensity and direction.
3. Some chemical reactions need several months to take place such as **reaction of oils with caustic soda**.
4. The electromotive force of three similar cells connected in parallel is **twice** the electromotive force of one cell.

B Explain on genetic bases :

The mating between two pea plants, one of them is hybrid red flowers and the other is white flower, knowing that the symbol of the dominant trait is (R) and the recessive trait is (r).

C What is meant by ... ?

The radioactivity phenomenon.

Question 4

A Put (✓) in front of the right statements and (✗) in the front of the wrong statements :

1. Some metal hydroxides decompose by heat into metal oxide and oxygen gas. ( )
2. Genes are considered as parts of DNA present in the cytoplasm of the cell. ( )
3. The speed of the chemical reaction depends on a lot of factors such as the temperature of the reaction. ( )
4. Thyroid gland secrets calcitonin hormone that controls the level of calcium in the blood. ( )

B Mention the disease that results from hormone disorder in the human body in the following cases :

1. Decrease in the secretion of the growth hormone at the childhood.
2. Increase in the secretion of thyroxin hormone.

C Calculate : the quantity of electricity that passes through a conductor, its resistance 2200 ohm for 120 seconds when it is connected to a source its potential difference equals 220 volt.

4 Qalyoubia Governorate

Answer the following questions :

Question 1

A Choose the correct answer :

1. The product of multiplying current intensity by the time needed to flow that current, produces a physical quantity which is measured by a unit called .....

   a. ampere. b. coulomb. c. ohm. d. volt.

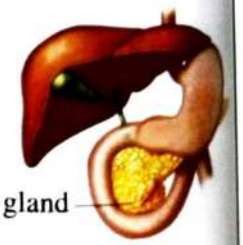
2. The gland illustrated in the figure in front of you, secretes two hormones which are .....

   a. thyroxin and calcitonin.

   b. thyroxin and adrenalin.

   c. insulin and glucagon.

   d. estrogen and progesterone.



The gland

3. The results of blood analysis in one of the medical laboratory for a person who is a worker in the nuclear energy authority, illustrates that : there is a change in the chemical composition of the blood's haemoglobin, so that is from the ..... effects of the nuclear radiation.

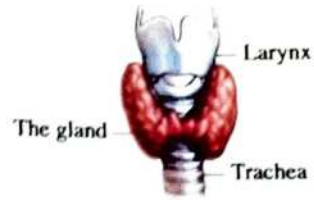
   a. cellular b. physical c. chemical d. genetic

4. If crossing takes place between a male and a female, the genetic composition for each of them is (Bb), so the ratio between the resulting offspring which carry the genetic composition (BB) to the total number of offspring is .....

a. $\frac{1}{2}$ b. $\frac{3}{4}$ c. $\frac{1}{1}$ d. $\frac{1}{4}$

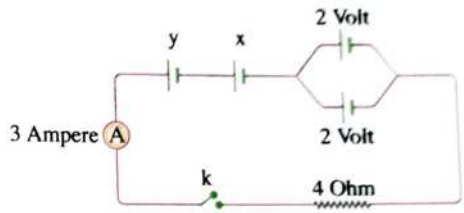
B Correct the underlined words :

1. The decrease in the secretion of the gland (in the figure in front of you) causes **dwarfism**.
2. The chemical formula of silver nitrate is **$NaNO_3$**
3. **Testosterone** hormone promotes the growth of endometrium.
4. On heating copper hydroxide, **copper and hydrogen** are formed.



C In the opposite circuit :

When closing the key, calculate the value of the electromotive force of a dry cell (x) (knowing that : the dry cells (x) and (y) are similar)



Question 2

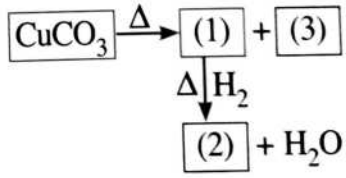
A First : Extract the unsuitable word (or statement) then write what connects among the rest words (or statements) :

1. Volt / Ampere – Coulomb / Second – Volt.second / Coulomb – Ohm.
2. Dwarfism – Gigantism – Diabetes – Simple goiter.

Second : Mention one importance for each of the following :

1. The rheostat.
2. The nuclear binding forces.

B First : Study the reactions in the diagram in front of you, then answer :

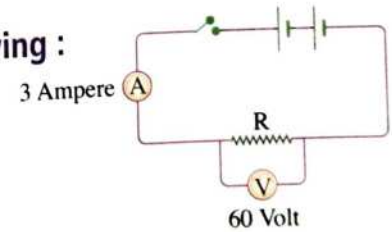


1. Write the chemical formulae for the substances number (1 , 2 , 3)
2. How can you detect number (3) ?

Second : Complete the spaces in the following table :

The hormone	The gland which secretes it	Its importance
.....(1).....	.....(2).....	Regulates the general growth of the body
Estrogen	.....(3).....	.....(4).....

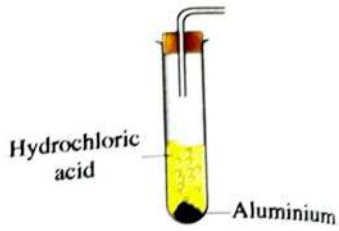
C In the opposite electric circuit : Calculate each of the following :



1. The work done by the battery (measured by joule) to transfer an electric charge through 2 seconds.
2. The value of the electric resistance (measured by ohm).

Question 3

A First : Study the opposite figure, then answer the following :



1. Noticed that the reaction is slow due to the formation of a compound which is hard to decompose. Write the chemical formula for that compound.
2. Mention the oxidizing agent in the reaction from the following ($Al^{+3} - H_2 - Al - H^+$)

Second : Give reasons :

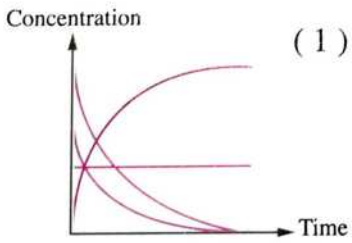
1. Oxidation or reduction processes did not happen in the double substitution reactions.
2. There is a strong relation between pancreatic gland and the adrenal gland.

B First : A man married a woman, one of them carries curly hair (dominant trait G) and the other carries the smooth hair (recessive trait g) and they have four offspring. If the ratio between the curly hair offspring to the smooth hair offspring as the ratio 1 : 1 - Explain on genetic principles the genetic structure for each of the parents and the produced offspring.

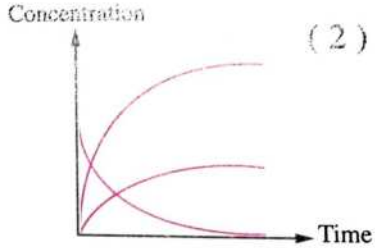
Second : What are the results that related to each of the following ?

1. Connection between two charged conductors (the potential difference between them is zero) by a connecting wire.
2. An endocrine gland worked by abnormal from.

C Relate each of the following reactions to the figure which represents it :



(1)



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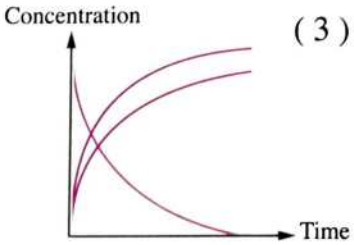

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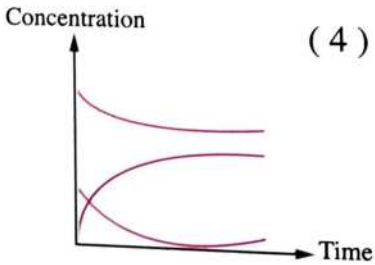


(4)

1. $N_2 + 3H_2 \longrightarrow 2NH_3$ (figure no : .....)
2. $2SO_2 + O_2 \xrightarrow{\text{catalyst}} 2SO_3$ (figure no : .....)
3. $2N_2O_5 \longrightarrow 4NO_2 + O_2$ (figure no : .....)
4. $CuSO_4 \xrightarrow{\Delta} CuO + SO_3$ (figure no : .....)

Question 4

A Write the scientific term for each statement of the following :

1. Ions exist in the aqueous solutions of the acids.
2. One of the methods of connecting the cells to obtain low electromotive force.
3. The only way to let the horomones of the endocrine glands to reach the target cells.
4. The cells that produce constant intensity and unidirectional electric current.

B First : Choose the correct answer from brackets and put it in the suitable place in each statement of the following :

(Henri Becquerel - Ohm - Gametes - Ali Mostafa Moshrafa - Gregor Mendel - Genes)

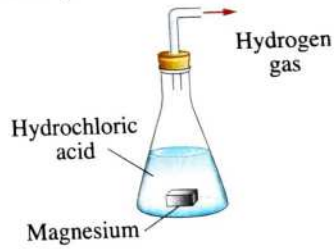
1. Basics of manufacturing the atomic bomb were based on the theories of the scientist .....
2. ..... are considered as parts of the nucleic acid DNA, and they are responsible for appearing the individual's hereditary traits.

Second : Compare between each of the following :

1. The direct current and the alternating current (according to the ability to transfer it through wires)
2. Mendel's first law, and Mendel's second law (according to the name)

C From the opposite figure :

1. Mention a suggestion to increase the amount of the evolved hydrogen gas.
2. Determine the reducing agent in that reaction.



5 Menofia Governorate

Answer the following questions :

Question 1

A Write the scientific term for each :

1. The device that is used to measure the electromotive force of an electrlc cell.
2. The trait that disappears in all individuals of the first generation in Mendel's experiment.
3. Appearance of a hereditary trait in all individuals of the first generation when the two individuals are crossed one of them is carrying a pure hereditary trait contrasting the trait carried by the other individual.
4. The radiation or nuclear energy emitted during nuclear reactions that can be controlled and carried out at nuclear reactors.

B Write one result for the occurrence of each :

1. The decrease in the secretion of thyroxin hormone due to the shortage of iodine in the food.
2. Adding an amount of sodium chloride (table salt) solution to silver nitrate.
3. Disability of the cells to consume glucose as a result of shortage of insulin hormone secretion.
4. Adding an amount of diluted hydrochloric acid to a cube of iron instead of iron fillings have the same mass.

C Calculate the potential difference between the terminals of a conductor :

When an electric current passes through it of (5 Ampere) intensity if the work done is (200 joule) within (2 second) ?

Question 2

A Choose from column (B) what suits it in column (A) :

(A)	(B)
1. A white colour chemical compound when heated it turns yellowish white and (O_2) evolves.	a. the electric generator (dynamo)
2. A green color chemical compound when heated it turns black and (CO_2) evolves.	b. the electric cell
3. The electric source in which kinetic energy is converted to electric energy.	c. the sievert (SV)
4. The international unit for measuring the absorbed radiation.	d. milli volt
	e. $CuCO_3$
	f. $NaNO_3$
	g. $Cu(OH)_2$

B Complete the following :

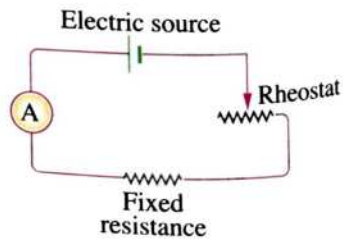
1. The change in the concentration of the reactants and the products in the unit time is known as .....
2. Oxidation and reduction are two ..... processes.
3. The chromosome chemically consists of nucleic acid (DNA) bind with .....
4. The dominant trait is the ..... hair in human.

C In the opposite electric circuit :

The reading of the Ammeter increases when :

1. ..... the resistance of the rheostat.
2. ..... the electromotive force of the source.

(Complete by suitable words)



Question 3

A Determine the odd (anomalous) word in each :

1. Radium – Uranium – Aluminium – Polonium.
2. Electric cell – Battery – Electric generator – Rheostat.
3. Estrogen – Progesterone – Testosterone – Adrenalin.
4. Dwarfism – Gigantism – Long sightedness – Exophthalmic goiter.

B Correct the underlined words :

1. Most of metals sulphate decomposed by heating into **the metal** and sulphur trioxide.
2. Mendel choose **five** genetic traits in pea plant for his experiments.
3. On adding 2 grams of a catalyst to a chemical reaction so at the end of the reaction the mass of the catalyst become **one** gram.
4. Mendel's first law is known as **independent assortment of the factors**.

C (The covalent compounds are slow in their reaction) **Determine two reasons ?**

Question 4

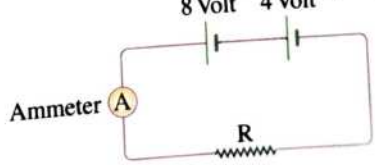
A Choose the correct answer in each :

1. All of the following are measuring units of elecric current intensity except .....
   a. Ampere. b. $\frac{\text{colomub}}{\text{second}}$ c. $\frac{\text{joule} \times \text{ohm}}{\text{coulomb}}$ d. $\frac{\text{joule}}{\text{coulomb} \times \text{ohm}}$
2. The reducing agent is a substance ..... during the chemical reaction.
   a. gives oxygen b. takes away oxygen
   c. takes away hydrogen d. gains electrons
3. The device that is used to measure the electric resistance is .....
   a. the ohmmeter. b. the ammeter. c. millivolt meter. d. the barometer.
4. On adding hydrochloric acid to a piece of silver .....
   a. silver chloride is formed. b. silver hydroxide is formed.
   c. silver oxide is formed. d. no reaction occurs.

B Put (✓) or (✗) in front of each :

1. Flowers of pea plant easy to be self-pollinated or artificially pollinated. ( )
2. The direct current can be transferred for a long distance across the wires. ( )
3. Mendel removed the anthers of pea flowers after maturation of the anthers. ( )
4. Electromotive force of a group of similar electric cells connected on parallel equal the electromotive force of one electric cell. ( )

C In the opposite electric circuit, what is the value of the resistance (R) which make the reading of the ammeter (4 Amperes) ?



6 Dakahlia Governorate

Answer the following questions :

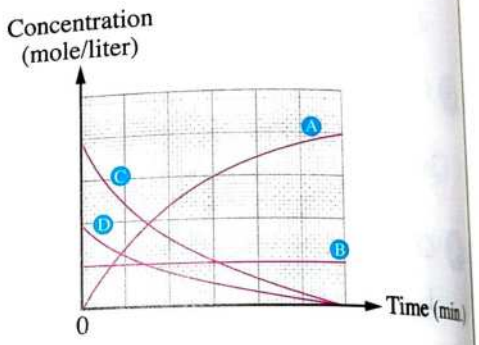
Question 1

A Complete the following sentences :

1. Electric generators produce ..... current, while dry cells produce ..... current.
2. $Na_2CO_3 + 2HCl \longrightarrow$ ..... $+ H_2O +$ .....
3. The international unit for measuring the absorbed radiation by humans is ..... While Volt × Ampere × Second is equivalent to .....
4. When the amount of iodine in the human diet decreases, secretion of the..... hormone decreases and leads to infection with .....

B Firstly : In the opposite figure detect each of the following :

1. Reactants
2. Products
3. Catalysts



Secondary :

Using the given symbols, write the equation for the given reaction.

C Calculate the amount of work required for a charge of 40 coulombs to pass through a section of a conductor whose resistance is 10 ohms and the current flowing through it is 2 Amperes.

Question 2

A Choose the correct answer :

1. This reaction ($Cl_2 + 2e^- \longrightarrow 2Cl^-$) expresses a ..... process.
   a. decomposition b. oxidation c. reduction d. substitution
2. If the current flowing through an electrical resistance of 10 ohm is doubled, then the value of the resistance is ..... ohm at a given temperature.
   a. 5 b. 10 c. 20 d. 40
3. When nitrogen pentoxide gas is decomposed, ... gas is evolved.
   a. nitrogen b. carbon dioxide c. hydrogen d. oxygen
4. Genes control the appearance of genetic traits of an organism by production of .....
   a. hormones. b. chromosomes. c. enzymes. d. vitamins.

B Correct the underlined words :

1. Mendel's second law is called the law **of segregation of factors**.
2. **A white** precipitate is formed when magnesium is added to copper sulphate solution.
3. The ohmmeter is used to measure the **electric charge**.
4. The pancreas secretes **estrogen** hormone when the blood sugar level drops.

C If a black mouse (Bb) marries a brown female (bb). Explained on genetic basis the characteristics of the resulting generation and the percentage of the resulting offspring.

Question 3

A Write the scientific term of each of the following sentences :

1. The potential difference between the two poles of an electrical source in an open circuit.
2. An individual who carries a contrasting pair of genes for a particular trait.
3. A chemical substance that changes the rate of a chemical reaction without changing it.
4. Traits that are not transmitted from one generation to another.

B Study the following two equations and then answer :

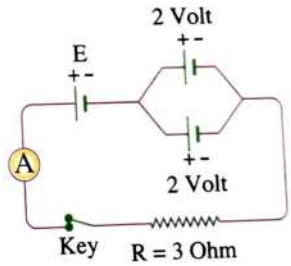
(1) $(A) \xrightarrow{\Delta} (B) + SO_3 \uparrow$ (blue substance)

(2) $(B) + H_2 \xrightarrow{\Delta} (C) + H_2O$

1. Write the chemical formula for both (A , B , C) in order.
2. What is the process that occurs for the substance (B) in the reaction number (2) to produce substance (C).

C In the opposite figure :

Calculate the value of (E) that makes the ammeter reading is 2 amperes.



Question 4

A Give reasons for each of the following :

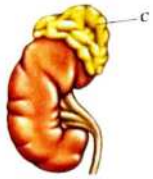
1. The pituitary gland is called the master of the endocrine glands.
2. Do not store silver nitrate solution in aluminium utensils.
3. The current passing through an electrical conductor decreases with increasing its length.
4. Uranium is considered a radioactive element.

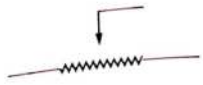
B What happen when ... ?

1. A person is exposed to a large dose of radiation for a short period of time.
2. Add a piece of copper to dilute hydrochloric acid.
3. Decrease in secretion of growth hormone in the childhood.
4. A dominant gene for a trait meets a recessive gene for the same trait.

PART 3

C Study the following figures and then answer the questions below for each one





1. What is the structure (C) ?
2. What is its function ?
3. What is the structure that in the figure.
4. What is its importance ?

7 Sharkia Governorate

Answer the following questions :

Question 1

A Write the scientific term of each of the following sentences :

1. A physical quantity its measuring unit is volt x coulomb.
2. The individual that carries a different pair of genes, one is dominant and the other is recessive.
3. It is the flow of electric negative charges in a conducting substance.
4. The trait that doesn't be transmitted from one generation to another.

B Complete the following sentences :

1. When approaching a burning fragment to ..... gas, it leads to explosion and ignition. While, when approaching it to ..... gas, it causes the glowing of the burning match.
2. In the reaction : $2Na + Cl_2 \longrightarrow 2NaCl$ ($_{11}Na$ - $_{17}Cl$), The substance which is oxidized is ....., and the oxidizing agent is .....
3. The function of ..... hormone is opposite to that of insulin hormone which are secreted by the pancreas.
4. Feeling very thirsty and multiple urination times is description of ..... disease, and the reason is the decreasing in the secretion of the ..... hormone.

C An electric current of 0.5 Ampere passes in an electric lamp and the potentail difference between its two ends is 12 Volt.

Calculate the work done requried to lighten the lamp for 5 minutes.

Question 2

A Correct the underlined words :

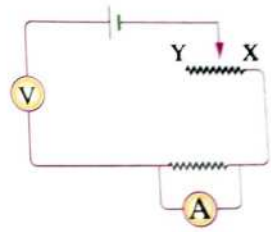
1. Most metal sulphates decompose when heated to metal oxide and **carbon dioxide gas**
2. The **alternating** current can only be transported for short distances.
3. $Na_2CO_3 + \mathbf{H_2SO_4} \longrightarrow 2NaCl + H_2O + CO_2$.
4. The effects of radiation on a human body can be divided into **four** groups.

B Choose the correct answer :

1. When two pea plants were crossed, both were tall-stemmed, and the resulting offspring was $\frac{3}{4}$ percent of tall-stemmed plants and $\frac{1}{4}$ percent of short-stemmed plants, then the genotype of the two crossed plants was .....
   a. Tt × Tt b. tt × Tt c. Tt × TT d. tt × tt
2. Active metals substitute hydrogen of water to produce ..... and hydrogen gas evolves.
   a. metal hydroxide b. metal oxide c. metal carbonate d. metal sulphate
3. In decomposition reactions, the compound decomposes into .....
   a. simple components. b. primary elements.
   c. other compounds . d. all the previous.
4. Scientists have found that the ..... are DNA parts present on the chromosomes.
   a. gametes b. genes c. cytoplasm d. no right answer

C Transfer the corresponding drawing on your answer sheet after correcting any errors in it.

In which direction (X or Y) the rheostat slider must be moved to decrease the reading of both devices ? And why ?



Question 3

A Put (✓) or (✗) in front of the following sentences :

1. The potential difference between two conductors determines the transference of the electric charges to and from an object when it is conducted to another conductor. ( )
2. The current intensity produced due to the flow of an amount of electricity 5400 coulomb in 5 minutes is 18 ampere. ( )
3. Endocrine glands secrete more than 500 hormones in the human body. ( )
4. Growth hormone is secreted by the testicles. ( )

B Cross out the odd word and join between the remain words :

1. Type of bonding in reactants – Temperature of reaction – Surface area of reactants exposed to reaction.
2. Free ear lobe – Smooth hair – Narrow eyes – Freckles.
3. Reaction between an acid and an alkali – Simple substitution reaction – Reaction of an acid with a salt – Reaction of a salt solution with another salt solution.
4. Hair color – Skin color – Number of fingers – The blood groups – Speaking in many languages.

C What changes occur when a piece of magnesium is placed in a beaker with a blue solution of copper sulphate. Explain your answer ? And write the balanced symbolic equation ?

Question 4

A Choose the correct answer :

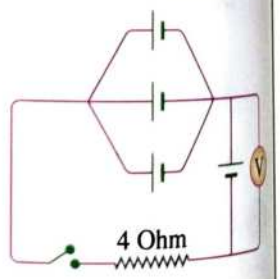
1. A chemical compound has green color and when heated changes into black with evolving a gas changes limewater into turbid is .....
   a. $NaNO_3$ b. $CuCO_3$ c. $CuSO_4$ d. $Cu(OH)_2$
2. We should not be exposed to nuclear radiation, knowing that the limit of the safe dose of radiation for public should not be exceed ..... per year.
   a. 1 sivert b. 0.01 sivert c. 0.001 sivert d. 20 millsivert
3. A chemical compound has white color and when heated changed into yellowish white with evolving oxygen gas is .....
   a. $CuCO_3$. b. $NaNO_3$. c. H_2O. d. $Cu(OH)_2$.
4. According to Ohm's law and assuming constant temperature, when the potential difference between two terminals of conductor doubled so the resistance of conductor .....
   a. doubled. b. decreases to half. c. remains constant. d. increases four times.

B Choose from column (B), what suits it in column (A) :

(A)	(B)
1. Ampere	a. volt/ampere.
2. Pea seeds are smooth in shape and yellow in color	b. carries two recessive traits.
3. Ohm	c. coulomb/second.
4. Pea seeds are wrinkled in shape and green in color.	d. carries two dominant traits.
	e. carries two dominant or recessive traits.

C In the oppsite figure. If you know that the electromotive force for each cell is 4 volt.

1. Calculate the reading of voltmeter.
2. Calculate the current intensity which passes through the 4 ohm resistance when the circuit is closed.



8 Gharbia Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. The chromosome is chemically consisted of a nucleic acid called DNA binds with .....
2. Transmission of electric charges depends on the ..... between two conductors.
3. The attached ear lobe is one of the ..... traits in the human.
4. Henri Becquerel discovered the emission of an unseen rays from ..... element.

B Put (✓) or (✗) in front of the following sentences :

1. Estrogen hormone promotes the growth of endometrium. ( )
2. Sweet potato contains oxidase enzyme which acts as a catalyst. ( )
3. Gigantism disease is a continuous growth in the limb's bones due to deficiency of growth hormone at the childhood. ( )
4. Nitrogen pentoxide breaks up into nitrogen dioxide and nitrogen gas. ( )

C If an electric current of 2 ampere passes through a conductor resistance equals 100 ohm, Calculate the work done to pass an electric charge equals 10 coulomb across the two ends of the conductor.

Question 2

A Choose the correct answer :

1. In adding silver nitrate solution to sodium chloride solution, ... precipitation is formed from silver chloride.
   a. red b. blue c. black d. white
2. The charge transferred by a constant current of intensity one ampere in one second is known as .....
   a. ohm. b. coulomb. c. volt. d. ampere.
3. The active metals can replace the hydrogen of water forming ..... and hydrogen gas evolves.
   a. metal hydroxide b. metal oxide c. metal carbonate d. metal sulphate
4. The unit of measuring the absorbed radiation is .....
   a. joule. b. coulomb. c. sievert. d. newton.

B Correct the underlined words in the following :

1. Mendel removed the **petals** from the flowers of pea plant to prevent the self-pollination.
2. The ionic compounds are fast in their reactions, because they decompose into **molecules** that easy share in the reaction.
3. Each **chromosome** produces a special enzyme which is responsible for producing a type of protein.
4. Speed (Rate) of chemical reaction is increased by **decreasing** the temperature.

C You have three similar cells, the electromotive force of each is 1.5 volt. Explain by drawing how can you get :

1. A battery of e.m.f. (1.5 volt)
2. A battery of e.m.f. (4.5 volt)

Question 3

A Write the scientific term of each of the following statements :

1. Organs secrete hormones directly in the blood stream.
2. The flow of electric negative charges through a conducting material.

3. A chemical substance that controls and organizes most of the vital activities and functions.
4. The opposition that the electric current faces during its passage through a conductor.

B What are the results of each of the following :

1. Putting small piece of sodium in a beaker containing water.
2. A gene failed to produce its own enzyme.
3. Replacing dilute hydrochloric acid by concentrated hydrochloric acid when reacting with magnesium.
4. Two pure individuals bearing two pairs of contrasting traits are crossed.

C Show by balanced symbolic chemical equalions how you can obtain :

1. Copper from copper sulphate solution.
2. Mercury from red mercuric oxide.

Question 4

A Put the suitable word in the missing parts in the following sentences :

(hydrogen – artificial – oxygen – natural – ohmmeter – oxidizing agent – ammeter - oxidization)

1. Cosmic rays are considered from the sources of ..... radiation pollution.
2. Some metal nitrates decompose into metal nitrite and ..... gas evolves.
3. A device that is used to measure the electric current intensity, ...
4. The substance which gives oxygen or takes away hydrogen during a chemical reaction, ...

B Choose from column (B) what suits it in column (A), then write the complete statement:

(A)	(B)
1. Learning of walking in children is from the	a. voltmeter.
2. Used to adjust the value of the electric current intensity and potential difference in the circuit	b. Mendel's second law.
3. The law of segregation of factors is the law of Mendel	c. hereditary traits.
4. The region chosen to store radioactive wastes	d. sliding rheostat.
	e. Mendel's first law.
	f. should be stable.
	g. acquired traits.
	h. should be unstable.

C Compare between :

The dynamo and the dry cell

"according to : the change of energy in each case"

9 Damietta Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. Nuclear energy can be used in industrial field to convert sand into .....
2. The unit that is used in measuring work is .....
3. The Mendelian hereditary trait in living organism is controlled by one pair of .....
4. The traits that are not transmitted from one generation to another are called .....

B Write the scientific term for each of the following :

1. The chemical substance that controls and organizes most of body vital activities.
2. A chemical process in which an atom of the element gains one electron or more.
3. The disease caused by the decrease in the secretion of thyroxin hormone.
4. Compounds their reactions are slow and occur between their molecules.

C 1. **You have four electric cells,** the electromotive force of each is 2 volt. **show by drawing only,** How can connect them to obtain a battery of an electromotive force of 4 volt. **(with three different ways)**.

2. **What is the result of ... ?**

Two conductors having the same electric potential are connected together by a wire.

Question 2

A Correct the underlined words :

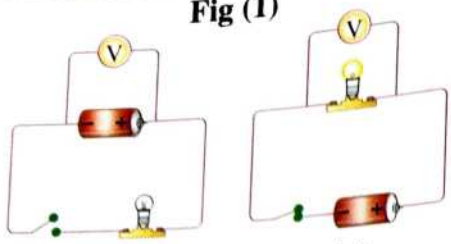
1. In the reaction : $H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$ **hydrogen** is an oxidizing agent.
2. The resistance of a conductor that 1 ampere is passed through it when the potential difference between its terminals is 1 volt equals **10 ohm**.
3. In **positive catalytic** reactions, catalyst is used to slow down the chemical reaction.
4. The first which is affected by exposure to large dosage of radiation for a short time is the **stomach**.

B Choose the correct answer :

1. From the compounds which decompose by heat into metal and oxygen is .....
   a. HgO b. $CuCO_3$ c. $CuSO_4$ d. $Cu(OH)_2$
2. The genetic structure of smooth green colored seeds of a pea plant is .....
   a. YYSS b. yyss c. YYss d. yySS
3. Enzymes act as ..... in most of biological process.
   a. oxidizing agent b. detergent agent c. catalysts d. reducing agent
4. Malnutrition produced as a result of deficiency of vitamin (A) in the body may lead to .....
   a. cancer disease. b. losing the sight. c. pollo. d. deafens.

C From to figures in front of you answer what is required below :

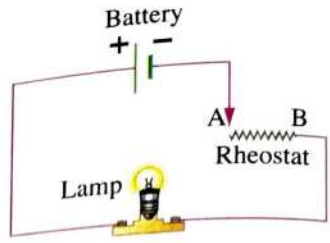
Fig (1)



(B) (A)

- In Figure (A) the voltmeter is used to measure .....
- In Figure (B) the voltmeter is used to measure .....

Fig (2)



- What happen to the illumination of the lamp, when the slider of the rheostat moves from point (A) to point (B) and state the reason ?

Question 3

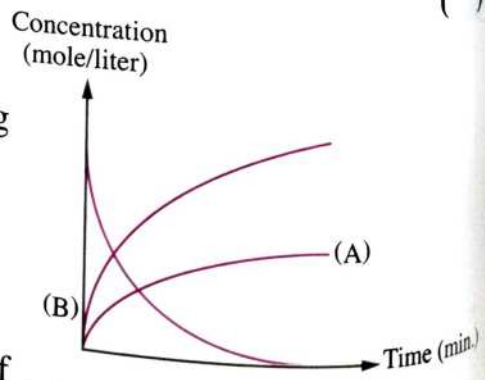
A Correct the underlined words :

1. When the level of sugar decreases in the blood, pancreases secretes **insulin** hormone.
2. If the potential difference between two terminals of a conducted equals 3 volt, to transfer an electric charge of 5 coulomb. So the value of the work done equals **45 ohm**.
3. Hormones transfer from their sites of secretion to reach their sites of action by the **skin**.
4. The radioactive element nuclei contain a number of **protons** more than the number required for stability.

B Put (✓) or (✗) in front of the following statements :

1. Neutralization is a reaction between salt and water to form an acids and an alkali. ( )
2. When a hybrid red flowers pea plant is pollinated with white flowers pea plant, all the produced plants are red flowers pea plants. ( )
3. Genes are parts of DNA found on chromosomes. ( )
4. By increasing the surface area of the reactants exposed to reaction, the chemical reaction stops. ( )

C The opposite graph illustrates :



The breaking up of SO_3 into SO_2 and O_2 as the following equation : $2SO_3 \xrightarrow{\Delta} 2SO_2 + O_2$

(a) 1. By the end of the reaction, the concentration of SO_3 will be equal to ..... mole/liter.

2. The graphical (A) demonstrates the concentration of .....

(b) If we add a catalyst to the previous reaction. Draw a graphical line from the point (B) demonstrates this catalyst.

Question 4

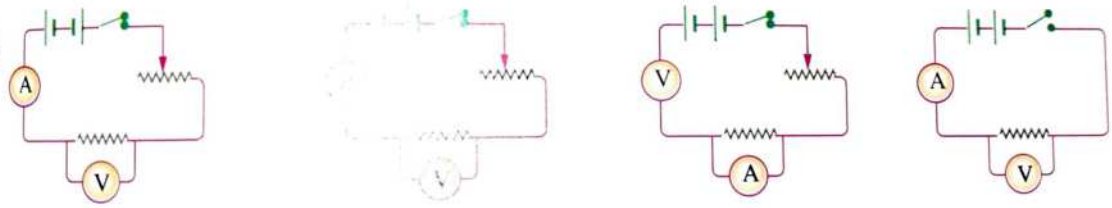
A Choose from column (B), what suits it in column (A) :

(A)	(B)
1. The region chosen to store radioactive wastes	a. salt of an acid is formed and hydrogen gas evolved.
2. Sodium nitrate decomposes, by heating	b. has a variable intensity and direction.
3. Aluminium replaces hydrogen of dilute acid	c. should be stable.
4. The alternating electric current	d. and produce yellowish white substance and oxygen gas evolved.
	e. should be unstable.
	f. has a constant intensity and direction.

B Write the scientific term for each of the following statements :

1. The trait that disappears completely in the individuals of the first generation in Medel's experiments.
2. The cells which can be used to convert the chemical energy into electric energy.
3. The substance formed by the gene and it is responsible for the occurrence of chemical reaction to form protein and appearance of genetic trait.
4. The spontaneous decay of atoms nuclei of some radioactive elements that are present in nature, In an attempt to achieve more stable composition.

C



(A) (B) (C) (D)

1. (a) Choose the right electric circuit which is used to verify Ohm's law practically.
   (b) Write the mathematical relation of Ohm's law.
2. What happens when ... ?
   The flow of negative electric charges (electrons) in a metal wire and in only one direction.

10 Kafr El-Sheikh Governorate

Answer the following questions :

Question 1

A Complete the following statements :

1. The current produced from electrochemical cells is the ..... current.
2. When the amount of iodine decreases in food the secretion of the ..... hormone decreases.

3. The double substitution reactions between salt solutions are accompanied by the formation of .....
4. The colour of copper carbonate changes from green to ..... when heated.

B Write the scientific term of each of the following statement :

1. The arrangement of metals in a descending order according to their chemical activity.
2. The quantity of charges transferred by a constant current intensity of one ampere in time of one second.
3. The trait that appears in all individuals of the first generation in Mendel's experiment.
4. Parts of DNA that are present on the chromosomes and control the hereditary traits of the individual.

C Compare between :

Oxidizing agent and Reducing agent (According to the electronic concept)

Question 2

A Choose the correct answer :

1. On heating copper sulphate, a ..... colour precipitate is formed.
   a. yellow b. blue c. red d. black
2. Genes control the organism genetic characteristics by producing .....
   a. hormones. b. enzymes. c. catalyst. d. vitamins.
3. Electromotive force and potential difference have same measuring unit is .....
   a. ohm/ampere. b. ampere/ohm.
   c. coulomb/joule. d. joule/ampere. second.
4. The ..... hormone stimulate glucose storage in the liver.
   a. calcitonin b. thyroxin c. glucagon d. insulin

B Correct the underlined words :

1. The dynamo is used to convert the **chemical** energy into electric energy.
2. Cosmic radiation is considered as **artificial** source of radiation pollution.
3. Most metal sulphate is decomposed by heat into **metal** and sulphur trioxide.
4. The hereditary traits are found inside the **cytoplasm** of the cell of the living organism.

C What happens when ... ?

Putting a piece of magnesium sheet in a test tube containing blue copper sulphate solution.

Question 3

A Put (✓) or (✗) in front of the following statements :

1. Gigantism is a continuous growth in limbs bones in childhood. ( )
2. The e.m.f. of three similar cells connected in parallel is equal to the e.m.f. of one cell. ( )

3. Adrenalin hormone stimulate body's organs to respond to emergencies. ( )
4. The ohmmeter is used to measure the potential difference of an electric circuit. ( )

B Illustrate by balanced chemical equation :

1. Passing the hydrogen gas through hot copper oxide.
2. The reaction between hydrochloric acid with sodium carbonate.

C Problem :

Calculate the potential difference two terminals of conductor with electric current intensity 5 ampere in time 10 seconds. If the work was 200 joule.

Question 4

A Give reasons for :

1. The fridge is used to preserve food.
2. Mendel cultivated pea plants produce yellow seeds for several generations.

B A battery consists of three electric cells, the e.m.f. for each is (1.5 volt). Illustrate by drawing how to get :

1. 4.5 volt 2. 1.5 volt

C If you know that :

In the human, the trait of free ear lobe (E) dominates over the trait of attached ear lobe (e) trait. What will be the result of marriage of a man and a woman both are hybrid. Show this case on genetic bases.

11 Behiera Governorate

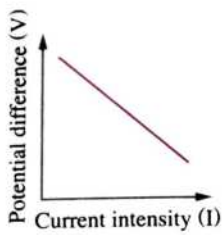
Answer the following questions :

Question 1

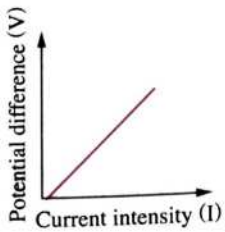
A Choose the correct answer :

1. On adding copper turning to diluted hydrochloric acid.....
   a. hydrogen gas evolves. b. copper chloride solution forms.
   c. no reaction occurs. d. copper oxide forms.
2. The increase in the concentration of the reactants during chemical reaction, the ..... in the number of collisions between molecules.
   a. increase b. no change
   c. decrease then increase d. decrease
3. People who work in radiation field should not be exposed to the nuclear radiation in amounts more than ..... mili-Sievert.
   a. 5 b. 8 c. 20 d. 10

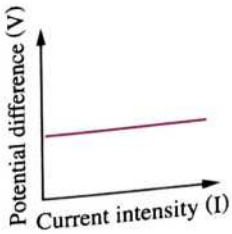
4. Which of the following diagram expresses Ohm's law ?



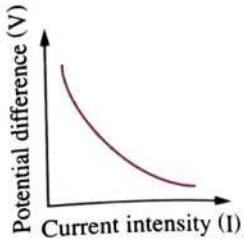
(a)



(b)



(c)



(d)

B Write the scientific term for each of the following :

1. A metallic can exists in most modern cars to treat the harmful gases resulted from burning fuel.
2. The opposition that electric current faces during its passage through a conductor.
3. The traits that are not transmitted from one generation to another.
4. The change in the concentration of the reactants and the products of the reaction at a unit time.

C Give reasons for the following :

1. It is better to use alternating current rather than the direct current.
2. The free ear lobe trait dominates over the attached ear lobe trait.

Question 2

A Put (✓) or (✗) in front of the following statements :

1. The two hereditary factors are similar in the hybrid individual. ( )
2. Transmission of electric charges between two conductors which are touched depends on current intensity of the conductors. ( )
3. The human genome project is concerned with the impact of different mutations on the function of genes. ( )
4. By using 3 gm of a catalyst in a reaction, its mass after finish the reaction is less than 3 gm. ( )

B Cross out the odd words or statements, then write the relation between the rest :

1. The nature of reactants – The concentration of products – Temperature of the reaction – Catalysts.
2. Diagnosis and treatment some diseases – Eliminating pests – Manufacturing the nuclear bomb - Drilling for petroleum.
3. Dwarfism – Diabetes – Cancer – Gigantism.
4. Pituitary gland – Salivary glands – Thyroid gland – Pancreas gland.

C Illustrate by balanced symbolic chemical equations the following reactions :

1. Heating blue copper sulphate.
2. The reaction of hydrochloric acid with sodium carbonate.

Question 3

A Rewrite the following statements after correcting the underlined words :

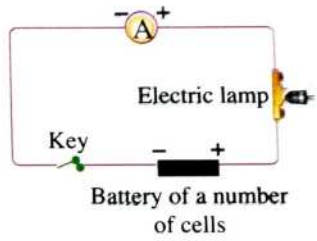
1. When a red flowers pea plant is pollinated with a white flowers pea plant all the produced plants are **yellow** flowers.
2. The atoms nuclei of radioactive elements contain a number of **protons** more than the number required for its stability.
3. The ratio of gametes (TR) in a pea plant whose genetic structure is (TtRr) is **75 %** according to Mendel's second law.
4. We can control the value of the potential difference and the current intensity in the electric circuit by using the **electric transformer**.

B Complete the following sentences with suitable words :

1. $AgNO_3 + NaCl \longrightarrow$ ..... + ...
2. Iodine element exists in the structure of ..... hormone.
3. Pancreas secrets ..... hormone when glucose level is increased in blood.
4. $Zn + 2HCl \longrightarrow$ ..... + ...

C In the opposite electric circuit :

If the ammeter reading is 0.1 ampere and the lamp resistance is 60 ohm and the e.m.f of each cell of the battery is 1.5 volt, **calculate** the number of cells which the battery consists of and needed to light the lamp.



Question 4

A Choose from columns (b) and (c) what suits them in column (a) :

N	(a)	(b)		(c)	
1	The ammeter	a	is used in measuring the electric resistance with	a	Joule/Coulomb
2	The battery	b	is used in measuring the potential difference with	m	Coulomb
3	The ohmmeter	c	is used to control current intensity passing through electric circuit	n	Coulomb/second
4	The voltmeter	d	is used in measuring the current intensity with	z	Volt/Ampere
		e	generates quantity of electricity in the electric circuit which is measured with	k	Joule

B **First :** To whom are the following works attributed :

1. Constructing a model of the DNA molecule.
2. Founding heredity.

Second : What is the reducing agent in the following reactions ?

1. $CuO + H_2 \xrightarrow{\Delta} Cu + H_2O$
2. $2Na + Cl_2 \longrightarrow 2NaCl$

C **Calculate** the electric current intensity that flows through a cross section of a conductor, if a charge of 3600 coulomb passes in 5 minutes.

12 Ismailia Governorate

Answer the following questions :

Question 1

A **Complete the following sentences with suitable words :**

1. The ..... apparatus is used to measure the electric current intensity in unit known as .....
2. ..... produce direct current while electric generators produce ..... current.
3. The trait that appears in first generation of Mendel's law is ..... trait, while the trait that disappears in first generation is ..... trait.
4. Complete the diagram .....

♀ \ ♂	YR	Yr
Yr	YY Rr	...(1)...
yR	...(2)...	Yy Rr

B **Correct the underlined words in the following sentences :**

1. The calcitonin hormone controls the level of **sugar** in the human body.
2. Pituitary gland is located below the **kidney**.
3. In chemical activity series, metals are arranged in a descending order according to their **atomic numbers**.
4. The reactions which take place inside the Earth to from **iron rust** may take millions of years.

C **If the work done to transfer a charge of 30 coulomb between two points is 3330 Joule, calculate the potential difference between the two points.**

Question 2

A **Choose the correct answer between brackets :**

1. When sodium nitrate is decomposed by heat, ... gas evolves.
   a. N_2 b. H_2 c. O_2 d. CO_2
2. The rate of most of chemical reactions ..... due to the increase in temperature.
   a. increases b. decreases c. doesn't change d. constant
3. The radiologist should not be exposed to radiation in amounts more than ..... milli sievert per year.
   a. 5 b. 8 c. 20 d. 70

4. The ..... current can be graphically represented by straight line parallel to the time axis.

a. alternating b. direct c. all the previous d. no correct answer

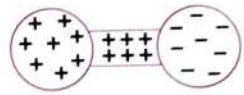
B Compare between :

1. Oxidation and reduction (according to the percentage of produced oxygen in the substance).
2. Ionic compounds and covalent compounds (according to the speed of reaction).
3. Dominant trait and recessive trait (according to the purity of the trait).
4. Mendel's first law and Mendel's second law (according to the number of contrasting traits).

C What happen when ... ?

In the opposite :

The electric potential at conductor (A) is larger than electric potential at conductor (B) (according to the flow of electric current)



Question 3

A Put (✓) or (✗) opposite to each of the following statements :

1. The nuclear energy can be used in diagnose and treat some diseases. ( )
2. The sliding rheostat is used to measure the electric potential. ( )
3. Iron element shares in composing thyroxin hormone. ( )
4. When the secretion of the growth hormone decreases in childhood, the person becomes a dwarf. ( )

B Choose from column (B) what suits with column (A) :

(A)	(B)
1. The gas that evolves when zinc reacts with hydrochloric acid	a. carries the genetic information.
2. The gas that evolves on heating mercuric oxide	b. aren't transmitted from one generation to another.
3. Acquired traits	c. hydrogen gas.
4. Nucleic acid	d. are transmitted from one generation to another.
	e. oxygen gas.

C From the following reactions :

1. $HCl + NaOH \longrightarrow H_2O + \boxed{X}$
2. $\boxed{X} + Ag\,NO_3 \longrightarrow \boxed{Y} + AgCl \downarrow$

write the chemical formula for (X) and (Y)

Question 4

A Write the scientific term :

1. The chemical reaction in which an element substitutes another element in its salt solution.
2. Chemical substance changes the rate of chemical reaction without changing.
3. The flow of electric negative charges through a conducting materials (metal wire).
4. The elements which a spontaneous change happens to their nuclei to reach a more stable structure.

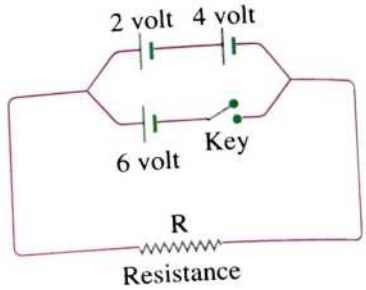
B Mention one importance of each of the following :

1. Voltmeter.
2. Alternating current.
3. Genetically modified rice.
4. The genes.

C Correct the underlined word in the following sentence :

In the opposite figure :

When the key is closed, the current intensity that passes through the resistance (R) **increases**.



13 Suez Governorate

Answer the following questions :

Question 1

A Choose the correct answer between brackets :

1. The mathematical relation of Ohm's law is .....
   a. $R = \frac{V}{I}$ b. $R = VI$ c. $R = V - I$ d. $R = V + I$
2. According to Mendel's second law, in the second generation the ratio between number of plants carry dominant traits to number of plants carry recessive traits is .....
   a. 1 : 1 b. 1 : 2 c. 12 : 4 d. 1 : 4
3. The measuring unit of the electric charge is .....
   a. Coulomb. b. Ohm. c. Volt. d. Newton.
4. ..... is from the dominant traits in the human being.
   a. Straight hair b. Wide eyes
   c. No dimples in the face d. Attached ear lobe

B What are the results of the following ... ?

1. Adding a piece of sweet potato to hydrogen peroxide.
2. Passing hydrogen gas over hot black copper oxide.
3. The secretion of growth hormone is decreased in childhood.
4. The pancreas stopped its secretion of the glucagon hormone.

C **You have four similar electric cells, the electromotive force of each one is 1.5 volt. Illustrate by drawing how you connect them to get a battery of e.m.f. equals 6 volt.**

Question 2

A **Write the scientific term for each of the following :**

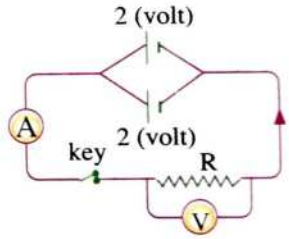
1. Chemical reactions in which the compound decomposes by heat into its simple components.
2. A chemical process in which the atom loses one electron or more.
3. The force needed to overcome the repulsion force between the positively charged protons that found inside the nucleus.
4. The process of spontaneous decaying of the atom's nuclei of some radioactive elements that are present in nature to achieve a more stable composition.

B **Correct the underlined words :**

1. When we add silver nitrate solution to sodium chloride solution, a white precipitate of silver **nitrite** is formed.
2. The (speed) rate of the chemical reactions increases by **constance** of temperature.
3. The **pure** individual carries a pair of non-similar hereditary factors for the trait.
4. When a pure, short stem pea plant is pollinated with a hybrid, long stem pea plant the produced plants are (dominant) long stem to (reccessive) short stem at a ratio of **(3 : 1)**.

C **In the opposite closed circuit :**

If a quantity of electricity which passes in the electric circuit through 60 seconds is 30 coulombs.



Find :

1. The ammeter reading (A)
2. The voltmeter reading (V).

Question 3

A **Complete the following statements :**

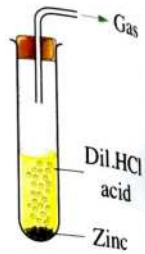
1. The potential difference between the two terminals of a conductor is ..... proportional to the electric current intensity passing through it at a constant temperature
2. The ..... effects of radiation is a result of changing the composition of the sex chromosomes of the cells.
3. $2HgO \xrightarrow{\Delta} 2Hg +$ .....
4. When the amount of iodine decreases in the food, the secretion of the ..... hormone decreases.

B Give reasons for the following :

1. Reactions between covalent compounds are slow, whereas reactions between ionic compounds are fast.
2. A red precipitate is formed when magnesium is added to copper sulphate solution.
3. Mendel selected the pea plant to conduct his experiments (give two reasons)
4. Blood is the only way for the hormone to reach its site of action for what is known as target cells.

C In the opposite figure :

On adding diluted hydrochloric acid to zinc, a gas is evolved :



1. Illustrate by a balanccd chemical equation the reaction between zinc and diluted hydrochloric acid.
2. What do you observe if zinc is replaced by copper turning ?

Question 4

A Get the odd word out :

1. Nature of reactants – Temperature – Concentration of resultants – Catalysts.
2. Mercury – Silver – Sodium – Gold.
3. Ammeter – Voltmeter – Ampere – Ohmmeter.
4. Radium – Aluminium – Uranium – Zirconium.

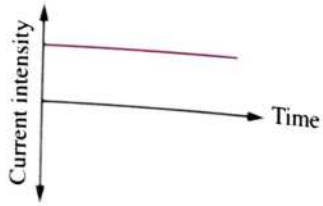
B Choose from the following words then put it in the suitable place :

(an oxidizing - neutralization - hereditary traits - a reducing - acquired traits - enzyme - chromosomes - simple substitution)

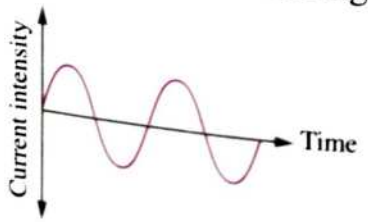
1. In this equation $2Na + Cl_2 \longrightarrow 2NaCl$ chlorine is considered as ..... agent.
2. The reaction between an acid and an alkali to form salt and water is called ..... reaction.
3. The traits that are not transmitted from one generation to another are .....
4. The substance formed by the gene and it is reponsible for the occurrence of a reaction resulting in a protein showing a hereditary trait is .....

C The two following figures represent the two types of electric current, study then answer :

What is the name of the source produces the current represented in each figure ?



(A)



(B)

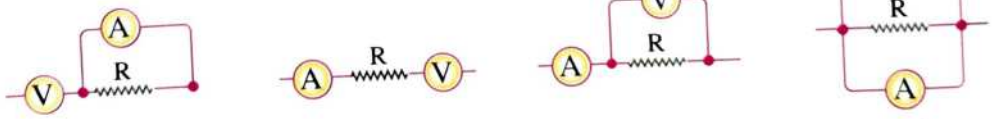
14 Port Said Governorate

Answer the following questions :

Question 1

A Choose the correct answer :

1. ..... glands secrete chemical substances are called hormones.
   a. Endocrine b. External c. Lymphatic d. Sweat
2. From examples of simple substitution reaction is .....
   a. reaction between an acid with an alkali. b. reaction between an acid with salt.
   c. reaction between metal with salt solution.
   d. reaction between salt solution with another salt solution.
3. The two scientists ..... discovered the role of gene in the appearance of hereditary traits.
   a. Watson and Creek b. Badel and Tatum
   c. Henri and Einstein d. Ohm and Mendel
4. Which of the following formulae represent the right relation between quantity of charges, electric current intensity and the time ? .....
   a. Current intensity = quantity of charge / time
   b. Quantity of charge = time / current intensity
   c. Quantity of charge = current intensity / time
   d. Current intensity = quantity of charge × time
5. Which of the following figures represents the right connection of the ammeter and voltmeter in a circuit ? .....



a. b. c. d.

6. Mendel removes ..... from the plant's flowers to prevent the self-pollination.
   a. stamens b. anther c. petals d. pituitary
7. ..... gland secretes hormone regulates the growth of the body as a whole.
   a. Pancreas b. Thyroid c. Adrenal d. Pituitary
8. To generate an alternating electric current, we use the .....
   a. dry cell. b. ohmmeter. c. voltmeter. d. dynamo.
9. Some traits are not transmitted from one generation to another such as .....
   a. hereditary traits. b. acquired traits. c. recessive traits. d. dominant traits.

10. Zinc element is more active than ..... element.
a. potassium b. hydrogen c. sodium d. magnesium

11. The hormone that stimulates the storage of glucose sugar in liver is .....
a. thyroxin. b. adrenalin. c. insulin. d. glucagon.

12. At the ending of any chemical reaction, the concentration of reactants is .....
a. 50 % b. zero c. 75 % d. 100 %

13. The reaction between silver nitrate solution with sodium chloride solution is ..... reaction.
a. fast b. average c. slow d. very slow

14. Which one of these traits is recessive in human ? .....
a. Curly hair. b. Wide eyes. c. Free ear lobe. d. Straight hair.

15. According to the Mendel's second law, the hereditary traits are inherited ..... a. independently. b. dependently. c. connected. d. collectively.

16. In the following reaction between sodium and chlorine :

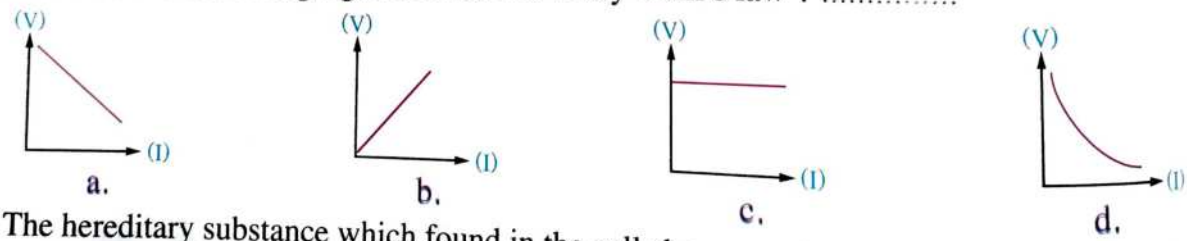
$Cl_{2\,(g)} + 2Na_{(s)} \longrightarrow 2Na^{+}Cl^{-}_{(s)}$

What is substance which is reduced in this reaction ? .....
a. Sodium ions. b. Chlorine atoms. c. Sodium atoms. d. Chloride ions.

17. By adding ..... the speed of breaking up of hydrogen peroxide increases.
a. manganese oxide b. manganese dioxide
c. magnesium oxide d. chromium dioxide

18. ..... from the effects of hereditary traits due to exposing a human to a small dosage of radiation for a long time.
a. Destroy the central nervous system b. Destroy the spleen
c. Changes in the sex chromosomes composition
d. Changes in the hemoglobin composition

19. Which of the following figures is used to verify Ohm's law ? .....



20. The hereditary substance which found in the cells has great information which control the traits, this hereditary substance is called .....
a. PNA b. NAD c. RNA d. DNA

21. The volt is equivalent .....
a. coulomb / ampere. b. ampere × second.
c. joule / coulomb. d. coulomb / second.

22. Catalytic convertor consists of ceramic cells covered with thin layer of a catalytic metal as .....
a. calcium. b. palladium. c. radium. d. silicon.

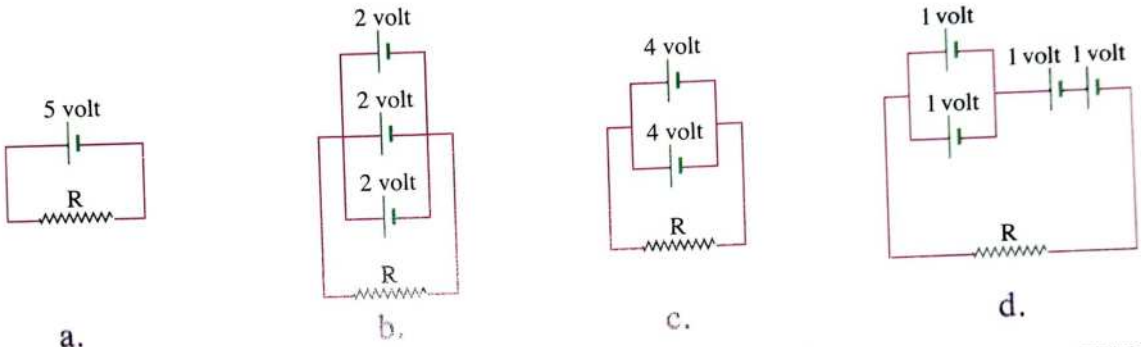
23. The individual who carries a different pair of genes for a hereditary trait ..... individual.

a. pure b. recessive c. hybrid d. dominant

24. On crossing male and female, their genotype (BB), so genotype (bb) is produced in their offspring at a percentage of .....

a. 25 % b. zero c. 75 % d. 50 %

25. The following figures illustrate electric circuits contain a resistance is connected with battery or more, which of following circuits the total electromotive force is more ..... ?



a. b. c. d.

26. To control the value of electric resistance in electric circuit we use ..... apparatus.

a. ammeter b. voltmeter c. ohmmeter d. rheostat

27. When ..... compound decomposes by heat oxygen gas is evolved.

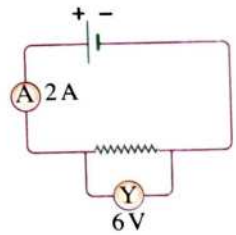
a. HgO b. $CuSO_4$ c. $CuCO_3$ d. $Cu(OH)_2$

28. ..... resulted due to the increase in secretion of the thyroxin hormone.

a. Gigantism b. Exophthalmic goiter

c. Dwarfism d. Simple goiter

B From the opposite figure :



29. **Calculate** the value of resistance by ohm.

30. **Calculate** the quantity of electricity that passes in circuit through half minute.

31. What would happen when the number of neutrons in the nucleus of the element is larger than its stability level ?

32. **Give reason** the rate of chemical reaction increases when the concentration of reactants increases.

33. Mention one use for electrochemical cell.

34. A wire of iron its mass 10 grams and iron filing have the same mass of the wire are leaved in moist place. Which of them rust faster than the other ? Give reason.

15 Fayoum Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. Dry cells produce ..... electric currents while electric generators produce .....
2. From the cellular effects of radiation occurrence of changes in composition of ..... electric current.
3. The traits which are not transmitted from one generation to another are ..... traits, like the chemical change in .....
4. The position of flowers in pea plant is..... or ..... while blood groups from ..... traits.

B Correct the underlined words :

1. Some metals replace hydrogen of water, and metal **carbonate** is produced.
2. The speed of chemical reaction increases when the temperature of reaction **is constant**.
3. Goiter is occurred due to enlargement of **pituitary** gland.
4. **Insulin** hormone stimulates the release of glucose sugar from the liver.

C Mention the physical quantity which is measured by the following units :

1. Volt / ampere.
2. Joule / volt.

Question 2

A Write the scientific term :

1. The trait that appears in all individuals of first generation in Mendel's experiments.
2. The living organism which carries impure trait.
3. The state of an electric conductor that shows the transfer of the electricity from or to it, when it is connected to another conductor.
4. The method of connecting the electric cells to produce the greatest e.m.f. (electromotive force)

B Put (✓) in front of correct statements and (✗) in front of wrong statements :

1. A yellow substance is formed by heating copper carbonate strongly. ( )
2. Mole / litre is the measuring unit of reactants or products concentration in the chemical reactions. ( )
3. The chromosome is chemically consisted of a nucleic acid called DNA bind with the protein. ( )
4. From dominant characters in human is the presence of check dimples. ( )

C Draw the method of connection of 3 electric cells the e.m.f. of cell number 1 and 2 is 1.5 V for each one, and the e.m.f. of the third cell is 3 V, to produce a battery its e.m.f. equals :

first : 4.5 V second : 3 V

Question 3

A **Select from the column (B) what suits it from column (A), then rewrite the complete sentences :**

(A)	(B)
1. Nuclear energy	a. used in measuring the electric current intensity.
2. Ammeter	b. promote the growth of endometrium.
3. Dwarfism	c. used in diagnosing and treating some diseases like cancer
4. Two ovaries	d. occur due to decreasing secretion of growth hormone during childhood.
	e. occur due to increasing secretion of thyroxin hormone.

B **Complete the following by using words in between brackets :**

(speed of chemical reaction – segregation of factors – recessive – oxidation)

1. The chemical process in which the atom loses an electron or more is known as .....
2. The change in the concentration of the reactants and products at a unit time is known as .....
3. The first Mendel's law is known as the law of .....
4. The genetic trait which is always pure is known as .....

C **By using the following substances :**

diluted hydrochloric acid / sodium chloride solution / silver nitrate solution / sodium carbonate salt , show by balanced symbolic equation how can you get :

1. white precipitate.
2. gas which turbids clear limewater.

Question 4

A **Choose the correct answer :**

1. Which of the following substances doesn't give black products by heating it, ...
   a. HgO b. $Cu(OH)_2$ c. $CuSO_4$ d. $CuCO_3$
2. In the reaction : Hydrogen + copper oxide $\xrightarrow{\Delta}$ copper + water, ... acts as oxidizing agent.
   a. copper oxide b. hydrogen c. copper d. water
3. If an electric current of 0.01 ampere passes through a conductor for half hour, so the amount of electricity which passes through this conductor equals ..... coulomb.
   a. 3 b. 5 c. 18 d. 200
4. In dynamo the ..... energy is converted into electric energy.
   a. magnetic b. kinetic c. chemical d. light

B **Write an example for the following:**

1. A physical quantity that is measured by joule.
2. An artificial source of radioactive pollution.
3. A chemical reaction that takes millions of years.
4. A positive catalyst.

C **Calculate the resistance of an electric wire,** if the potential difference between its poles 4 volts, when an electric current of charge equals 6 coulomb passes through it for 3 seconds.

16 Beni-Suef Governorate

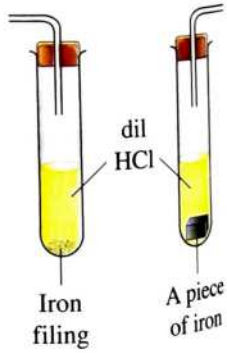
Answer the following questions :

Question 1

A **Choose the correct answer :**

1. The value of the resistance of a conductor in an electric circuit, is changed on changing .....
   a. conductor dimensions.
   b. electric current intensity passing through it.
   c. quantity of electric charges pass through it.
   d. time of connection.
2. The recessive trait appears in an individual if he inherited from the parents .....
   a. two dominant genes.
   b. one dominant gene and the other is recessive gene.
   c. two recessive genes.
   d. only one dominant gene.
3. In the electric generators, ... energy is converted into electric energy.
   a. magnetic b. kinetic c. chemical d. light
4. According to first Mendel law the hereditary traits .....
   a. duplicate. b. segregate. c. disappear. d. shrink.

B **First : Study the opposite figure, then answer the questions :**



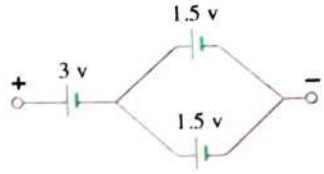
1. The factor that affects the speed of this chemical reaction is the acid concentration (the previous statement is correct or false).
2. Complete the following equation :

$$Fe + 2HCl \xrightarrow{\text{dil.}} FeCl_2 + \text{.....} \uparrow$$

Second : According to hormones :

1. What is the name of the hormone that secreted by pancreas when the level of glucose sugar increases in blood ?
2. What is the hormonal disorder (disease) that results from the inability of the pancreas to secrete this hormone ?

C From the opposite figure :



1. Mention the value of the e.m.f. in the cell.
2. Redraw the cell to obtain an e.m.f. equals 6 volt.

Question 2

A Complete the following sentences :

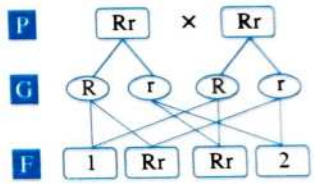
1. The chemical process in which the atom loses an electron or more, is known as .....
2. The electric current that is produced from an electric generator is preferred than that is produced from .....
3. The substance that decreases the energy needed for a reaction, is known as .....
4. In the ..... field the nuclear energy is used to convert sand into silicon.

B First : The opposite figure shows :

Two tubes, the first one containing sodium carbonate and the second contains sodium hydroxide, then by adding dil. hydrochloric acid to both :

1. Name the evolved gas in the first tube.
2. Mention the type of the chemical reaction in the second tube.

Second : The opposite figure that :



explains a self-pollination process between two hybrid red flowers pea plant.

1. Replace labeled numbers with the correct symbols.
2. Results apply the law of independent assortment of hereditary factors

put (✓) or (✗) in front of the statement.

C If the work done to transfer a quantity of charge of 3 coulomb is 660 joule between two points of a conductor calculate the potential difference between this two points.

Question 3

A Write the scientific term :

1. A gland that secretes a hormone responsible for the appearance of the male secondary sex characters.
2. Hormone stimulate body's organs to respond to emergencies.
3. Quantity of electric charges that flowing through a cross-section of a conductor in one second.
4. The increase in the amount of radiation in the environment.

B Correct the underlined words :

1. **Tatum** scientist is considered as the founder of genetics.

2. The **pure** individual carry one dominant gene of a hereditary trait and other is recessive gene.
3. The reactions of ionic compounds are fast because they dissociate completely into **molecules**.
4. By adding silver nitrate solution to sodium chloride solution, it forms **red** precipitate from silver chloride.

C From the opposite figure answer the following :

1. Write the balanced chemical equation.
2. How to detect the evolved gas.

Question 4

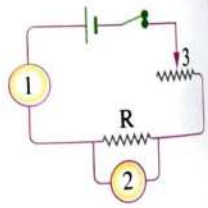
A Put sign (✓) in front of correct statements and sign (✗) in front wrong ones :

1. At the end of a chemical reaction the concentration of reactants equals 100 %. ( )
2. The international measuring unit of absorbed nuclear radiation is ohm. ( )
3. Oxidation and reduction reactions takes place separately. ( )
4. Flow of electric charges from one conductor to another depends on the quantity of electric charges in each of them. ( )

B Answer as required :

1. Voltmeter is used in measuring ..... (Complete)
2. Chemically consists of nucleic acid and proteins. (Write the scientific term)
3. One of the recessive traits in the human is curly hair. (Put right or wrong)
4. If the chemical composition of the hemoglobin changes it becomes incapable of carrying **nitrogen** to all body cells. (Correct underline word)

C The opposite figure represents a law that you studied :



1. Name this law.
2. Write the text of this law.

17 Minia Governorate

Answer the following questions :

Question 1

A Write the scientific term of each of the following :

1. The flow of electric negative charges (the electrons) is a conducting substance as a metal wire.
2. The opposition that the electric current faces during it's passage through a conductor.
3. Parts from nucleic acid DNA present on the chromosomes.
4. The member that carries two different factors, one of them is related to the dominant trait and the other factor is related to the recessive trait.

B **Put (✓) at front of right answers and (✗) at front of wrong answer :**

1. Enzymes act on (lead to) increasing the speed of biological reactions inside the human body. ( )
2. The reaction of oil with caustic soda needs several monthes to take place. ( )
3. Dwarfism is resulting from the decrease in the secretion of the insulin hormone in human body. ( )
4. Thyroxin hormone liberates the energy necessary for the body from food. ( )

C **You have three clectric cells, the e.m.f. of each cell is 1.5 volt. Show with drawing, how to connect them together to have electromotive force equals :**

first : 4.5 volt second : 1.5 volt

Question 2

A **Complete the following sentences by suitable words from the words between brackets :**

(catalytic converter – nucleus – radium – neutralization – airbags)

1. Reaction of acid and alkali is known as ..... reaction.
2. ..... is considered as energy store.
3. From examples of natural radioactive elements is .....
4. Ceramic (metallic) cells are connected to the tube of the emitted gases from the engine present in modern cars is called ....

B **What are the results for each of the following ... ?**

1. Concentration of reactants reaches to zero.
2. Get the lightened stick of matches close to the mouth of a tube has mercuric oxide during heating.
3. The crossing over of two members of any pair to homozygous hereditary traits which differ from each other, for the F_1 generation and F_2 generation according to Mendel's first law.
4. The gene failed in producing its special enzyme.

C **Calculate the electric current intensity on passing quantity of electricity equals 6000 coulomb in the cross section of a conductor during 10 minutes.**

Question 3

A **Correct the underlined words :**

1. From the site of its secretion, hormone reaches to the target cells through **the skin**.
2. By using **voltmeter,** the value of the current intensity and potential difference in the circuit, can be controlled.
3. **Adrenalin** hormone, promotes the growth of endometrium.
4. The current which is produced from the electric generators is called **direct** current.

B Choose from coulumn (A) what is suitable from coulomb (B) :

(A)	(B)
1. On adding silver nitrate solution to sodium chloride solution, the precipitate is	a. dominant trait.
2. On reacting sodium carbonate with dilute hydrochloric acid the gas evolved is	b. carbon dioxide gas.
3. The ability to roll the tongue is one of	c. hydrogen gas.
4. Mendel's second law is called.	d. silver chloride.
	e. independent assortment of the hereditary factors.

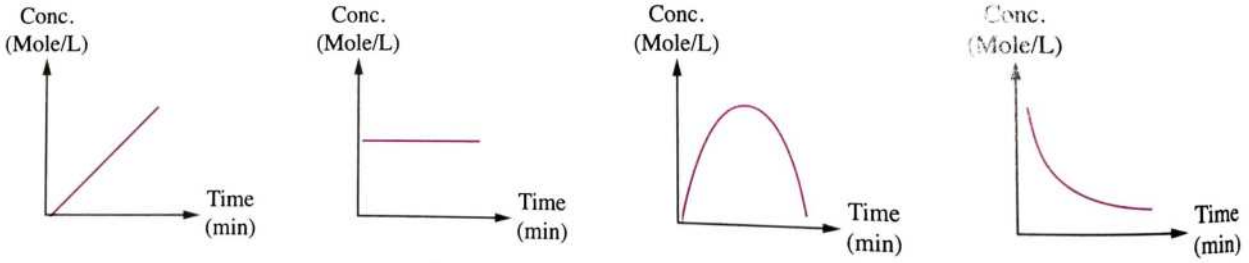
C Show by the balanced symbolic equation each of the following :

1. The appearance of black color on heating blue copper sulphate.
2. Passing hydrogen gas on hot copper oxide.

Question 4

A Choose the correct answer :

1. From the uses of nuclear energy in the ..... field is to improve of some plant races.
   a. medical b. drilling c. industrial d. agricultural
2. ..... is considered the responsible for carrying oxygen to all body cells.
   a. Bone marrow b. Blood hemoglobin c. Chromosomes d. All the previous
3. On reacting magnesium strip with dilute hydrochloric acid, the figure ..... expresses the change in the concentration of the hydrochloric acid by passing time.



4. When sudden and fast decrease in the speed of the car, this leads to the decomposition of sodium azid and ..... gas evolved.
   a. N_2 b. H_2 c. O_2 d. CO_2

B Give reason for :

1. Radioactive wastes should be buried rapidly away from streams of underground water.
2. Atoms unclei of some radioactive elements tend to lose a number of neutrons spontaneously.
3. People who depend on eating rice, suffer from the lack of vitamin A.
4. The learning how to walk for children, is not considered hereditary traits.

C Compare between alternating current and direct current accords to :

1. uses. 2. ability to transport it for distances.

18 Assiut Governorate

Answer the following questions :

Question 1

A Complete the following :

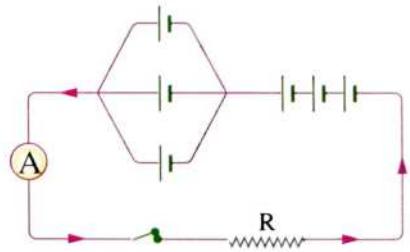
1. The potential difference between two terminals of a conductor is ..... proportional to the intensity of the electric current passing through it at a constant temperature.
2. Mendel covered the stigmas of flowers to prevent ..... pollination.
3. The radiologist should not be exposed to radiation amount more than ..... millisievert per year.
4. According to Mendel's first law, the two hereditary factors ..... when the gametes are formed.

B Put (✓) or (✗) in front of the following sentences :

1. The iodine element shares in composing thyroxin hormone. ( )
2. Neutralization is reaction between an alkali and salt forming an acid and water. ( )
3. The hormone reaches from the position of secretion to the target cells through the skin. ( )
4. Fireworks reaction is fast but rusting of iron needs million of years. ( )

C In the opposite electric circuit :

If the (e.m.f.) of each cell equals 2 volt and the resistance 4 ohms, calculate the ammeter reading.



Question 2

A Choose the correct answer :

1. When magnesium substitutes copper in copper salt solutions, the colour of the precipitate is .....

   a. black. b. red. c. blue. d. green.

2. All of the following are factors affecting in the rate of chemical reaction except .....

   a. the temperature of reactants. b. the concentration of reactants.

   c. the nature of reactants. d. the concentration of products.

3. The scientist who discovered radioactivity phenomenon was .....

   a. Ohm. b. Mendel. c. Becquerel. d. Watson.

4. An electric current, whose intensity is one ampere passes through a resistance of 20 ohm, then the intensity of electric current increases to 2 ampere in the same resistance, so the value of resistance.....

a. increases to double.
b. decreases to half.
c. decreases to quarter.
d. does not change.

B **1. If you have the following substances :**
(hydrochloric acid – silver nitrate – sodium carbonate – sodium chloride – copper)
Show by balanced symbolic equations only how to get :

A. a white precipitate.
B. a gas that disturbs clear limewater.

2. Explain by genetic method, the hybridization in the drosophila between a male and a female, each of them has long wings and the product is 45 members with long wings and 15 members with short wings. If you know that the symbol of long wing is (T) and short wing is (t) :

C **"Nuclear energy is used in peaceful fields"**

- Mention two important uses in agriculture field.

Question 3

A **Study the opposite figures, then answer the questions :**

1. Look at the following figures :

a. Figure number ..... it expresses the electric current that can be transmitted for long distances, and its source is .....

Figure (2)

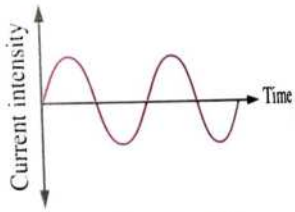
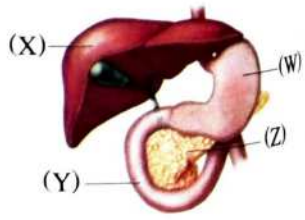


Figure (1)

b. The other figure is the type of electric current known as ..... , and its source is .....

2. Look at the opposite figure :

a. the symbol of the organ that produces a hormone which stimulates body cells to take glucose out of the blood is ..... , and the name of this hormone is .....



b. The symbol of the organ in which the body stores excess glucose is ..... , and the form in which excess sugar is stored is .....

B **Write the scientific term :**

1. The trait that disappears completely in the individuals of the first generation in Mendel's experiments.
2. The change in the concentration of the reactants and resultants at unit time.

3. The substance which is formed by the gene and it is responsible for the occurrence of chemical reaction.
4. A chemical process in which an atom of element loses one electron or more.

C Give reasons for :

- Preservation of food in the freezer of the refrigeration.

Question 4

A Choose from column (B), what suits it in column (A) :

(A)	(B)
1. Elements can't replace hydrogen of the diluted acid	a. ampere.
2. The measuring unit of the amount of electricity	b. relatively slow reaction.
3. The reaction of oil with caustic soda	c. Cu–Mg.
4. $\frac{\text{joule}}{\text{volt} \times \text{sec.}}$ equals	d. coulomb.
	e. Cu–Au.
	f. thermal decomposition reaction.

B Write the following statements in your answer sheet after correcting any errors :

1. The cellular effects of radiation causes changing in the sex chromosomes composition.
2. Mendel chose ten traits in pea plant to conduct his experiments.
3. Current intensity : it is the state of an electric conductor that shows the transfer of the electricity from or to it when it is connected to another conductor.
4. The two factors of hereditary trait are similar in the pure individual.

C What happens when ... ?

The length of the rheostat wire increases in the electric circuit
(according to : the electric current intensity – resistance)

19 Sohag Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. Ammeter connected in an electric circuit in..... connection.
2. The electrochemical cells produces ..... current.
3. ..... can be transmitted from one generation to another.
4. ..... is chemically consisted of nucleic acid called DNA bined with the protein.

PART 3

B Choose from column (B), what is suitable in column (A) in the following tables :

(A)	(B)
1. Neutralization	a. it is the enlargement of thyroid gland and the neck due to the decrease of the secretion of the thyroxin hormone.
2. The speed of a chemical reaction	b. it is the enlargement of thyroid gland accompanied by loss of weight, tension and exophthalmoses due to the increase of the secretion of the thyroxin hormone.
3. Estrogen	c. it is the reaction between an acid and an alkali forming salt and water.
4. Simple goiter	d. it is the hormone which is responsible for the appearance of female secondary sex characteristics.
	e. it is the change in the concentration of reactants and resultants in a unit time.

C Calculate the potential difference between the two ends of a vacuum cleaner whose resistance is 22 ohms and the current intensity passing through it is 10 amperes

Question 2

A Write the scientific term for each of the following :

1. Chemical reactions in which the compound is decomposed by heat into simple components.
2. A chemical process in which an atom of the element gains one or more electrons.
3. The quantity of electric charges that flow through a conductor in a time of one second.
4. The measuring unit of absorbed radiation.

B Put (✓) in front of true statements and (✗) in front of false ones :

1. The series of chemical activity is an arrangement of metals in ascending order according to their chemical activity. ( )
2. Genes are parts of DNA found in the cytoplasm of the cell. ( )
3. The presence of cheeck dimples is a recessive trait. ( )
4. Chemical reaction is the breaking up of bonds in reactants molecules and the formation of new bonds in the products molecules. ( )

C You have 4 similar electric cells. The electromotive force of each one is 1.5 volt. Illustrate by drawing how you connect them to get batteries of e.m.f. of :

a. 4.5 volts b. 6 volts

Question 3

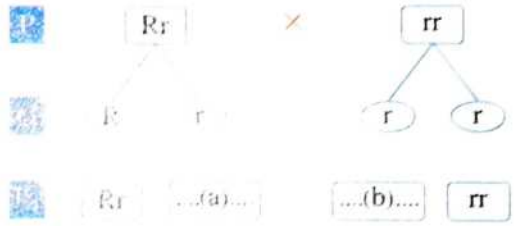
A Choose the correct answer :

1. The ..... is the measuring unit of the electric charges.
   a. coulomb b. ampere c. volt
2. The radioactive phenomenon was discovered by the scientist .....
   a. Ohm. b. Becquerel. c. Ampere.
3. There is a small gland in the size of a pea seed which is called ..... gland.
   a. pituitary b. thyroid c. adrenal
4. ..... hormone stimulates the storage of glucose sugar in liver.
   a. Calcitonin b. Glucagon c. Insulin

B 1. From the opposite reaction : $H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$

Identify the oxidizing agent and reducing agent

2. Complete the following figure, that illustrates the mixed pollination between two pea plants one of white flowers and the other of hybrid red flowers.



C Illustrate by balanced symbolic equation and mention the type of reaction :
The reaction of zinc with diluted hydrochloric acid.

Question 4

A Correct the underlined words :

1. The reactions of ionic compounds are **slower** than that of the covalent compounds.
2. The **simple substitution** reactions between salt solutions are accompanied by the formation of a precipitate.
3. In the electric generator the **chemical energy** converted into electric energy.
4. **Genetic effects** it is the changes that appear on a living organism as a result of exposure to radiation.

B Put the following words in the suitable space in the following statements :

(Electric current intensity – Electric resistance – The electromotive force – The dominant trait – segregation of factors)

1. ..... is the potential difference between the two poles of the battery when the electric circuit is open.

2. ..... is the opposition that the electric current faces during it's passage through a conductor.
3. ..... is the trait that appears in all individuals of the first generation.
4. Mendel's first law called .....

C **Give reason for :**

The speed of the chemical reaction increases as the concentration of the reactants increases.

20 Qena Governorate

Answer the following questions :

Question 1

A **Complete the following sentences :**

1. In Medel's experiments, he removed the stamens from the flowers to prevent ..... pollination.
2. Electric generators produce ..... current.
3. Learning of swimming in human is one of the ..... traits.
4. The international measuring unit of radiation absorbed by the human body is .....

B **Put (✓) or (✗) in front of the following statements :**

1. The simple goiter is resulted due to adrenalin hormone deficiency in human body. ( )
2. The alternating electric current can be converted into a direct electric current. ( )
3. Hormone is a chemical message that controls and regulates the activities and functions of most of the body organs. ( )
4. The mass of catalyst decreases at the end of the chemical reaction. ( )

C **Calculate :** the amount of work needed to pass an electric charge of 50 coulomb across a conductor with a resistance of 5 ohm and the electric current intensity passes through is 2 ampere.

Question 2

A **Write the scientific term :**

1. The change in the concentration of reactants and resultants at a unit time.
2. The quantity of charge transferred by a constant current intensity of 1 ampere in one second.
3. The radiation and nuclear energy emitted during nuclear reactions that can be controlled and carried out a nuclear reactors.
4. The enzyme which is found in sweet potato and accelerate the decomposition rate of hydrogen peroxide.

B Correct the underlined words :

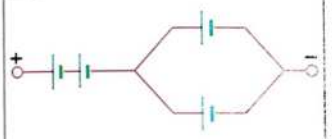
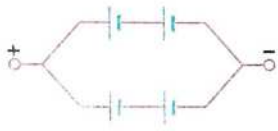
1. The reaction of an acid with an alkali produces **metal oxide** and water.
2. According to Mendel's first law, the dominant trait appears in the first generation by **50%**.
3. The voltmeter is connected in **series** in the electric circuits.
4. Genes are parts of DNA found in **the cytoplasm** of the cell.

C Give a reason for the following :

A white precipitate is formed on adding silver nitrate solution to sodium chloride solution.

Question 3

A From the following figures answer what is required below :

1.		2.
 (1)	 (2)	Glucose sugar in blood ⟵ Hormone (X) / Hormone (Y) ⟶ Glycogen in liver
- If the electromotive force of each electric cell in th previous batteries is 2 volt, then : A. The electromotive force of the battery in Figure (1) = ... B. The electromotive force of the battery in Figure (2) = ...		- Replace the hormone (X) and the hormone (Y) with suitable labels : A. The hormone (X) is ..... B. The hormone (Y) is .....

B Cross out the unsuitable word (or the unsuitable sentence) in each of the following :

1. $\frac{\text{Coulomb}}{\text{Second}}$ – Ampere – $\frac{\text{Joule}}{\text{Coulomb}}$ – $\frac{\text{Volt}}{\text{Ohm}}$
2. Pod colour – Flower position – Root length – Flower colour
3. Cesium – Barium – Uranium – Radium
4. Smooth hair – Narrow eyes – The presence of freckles in the face – The presence of dimples in the face.

C Compare between : Ionic compounds and covalent compounds (according to the speed of chemical reaction)

Question 4

A Choose from column (B) what suits it in column (A) :

(A)	(B)
1. When sodium carbonate reacts with dilute hydrochloric acid	a. hydrogen gas evolves.
2. When aluminium reacts with dilute hydrochloric acid	b. carbon dioxide gas evolves.
3. The phenomenon of radioactivity was discovered by the scientist	c. Ohm.
4. The relationship between the current intensity and potential difference was discovered by the scientist	d. Becquerel.

B Choose the correct answer :

1. The ..... is used to measure electric resistance.
   a. ammeter b. ohmmeter c. voltmeter d. rheostat
2. The genetic structure of smooth yellow coloured seeds of a pea plant is .....
   a. yyRR b. YYrr c. yyrr d. YYRR
3. In the electric cell, the ..... energy is converted into electrical energy.
   a. kinetic b. magnetic c. chemical d. light
4. Mendel's second law is known as the law of .....
   a. independent assortment of factors. b. segregation of factors.
   c. merging of factors. d. disappearance of factors.

C Show by the chemical equations only : how can obtain copper from copper sulphate in two different methods ?

21 Luxor Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. The ..... apparatus is used to measure the electromotive force.
2. The ..... traits are not transmitted from one generation to another.
3. In the electric cell ..... energy is converted into electric energy.
4. The ..... is chemically consists of a nucleic acid (DNA) combined with protein.

B Correct the underlined words :

1. The mass of the catalyst before the chemical reaction is **larger than** its mass after the reaction.
2. **The liver** secretes the insulin hormone when the level of glucose sugar in blood increases.

3. In the reaction : $Fe + 2HCl \xrightarrow{dil.} \underline{FeCl} + H_2\uparrow$

4. Deficiency of **Estrogen hormone** secretion in childhood causes dwarfism.

C **Calculate**

the current intensity passing through a cross-section of a wire, due to the flow of electric charges of 540 coulomb in one minute ?

Question 2

A **Write the scientific term :**

1. The flow of electric negative charges (electrons) in a conducting material.
2. The arrangement of metals in a descending order according to the degree of their chemical activity.
3. The international measuring unit of nuclear radiation absorbed by the human body.
4. The change in the concentration of the reactants and the resultants at a unit time.

B **Put (✓) or (✗) in front of the following sentences :**

1. Sodium chloride powder reacts faster than a cube of sodium chloride of the same mass. ( )
2. The hybrid individual carries two similar hereditary factors. ( )
3. Copper replaces magnesium in one of its salt solutions. ( )
4. Wide eye is one of the dominant traits in the human being. ( )

C **If you have :** 4 similar electric cells, the e.m.f. of each one is 1.5 volt, show by drawing how you connect them to obtain a battery its electromotive force equals **6 volt** and another battery with **1.5 volt** ?

Question 3

A **Choose from column (B) what suits column (A) :**

(A)	(B)
1. The quantity of electricity measuring unit is	a. ampere x ohm.
2. A gland that is called "master gland"	b. thyroid gland.
3. The potential difference measuring unit is equivalent to	c. coulomb.
4. A gland consists of two lobes that located on both sides of the trachea.	d. joule.
	e. pituitary gland.

B **(1) Use symbols :** to express the results from the pollination between white flowers pea Plant with another pure red flowers pea plant :

First : showing parents, gametes and the first generation.

Second choose : the ratio of the appearance of the white color character in the first generation is ..... (100 % – 75 % – 25 % – zero %)

PART 3

(2) In the opposite chemical reaction : $2NaNO_3 \xrightarrow{\Delta} 2NaNO_2 + (C)\uparrow$

First : What is the type of this reaction ?

Second : What is the name of the produced gas (C) ?

C Compare between :

Oxidizing agent and **Reducing agent** concerning **the electronic concept**.

Question 4

A Choose the correct answer :

1. The reaction of the silver nitrate with sodium chloride is from the ..... reactions.
   a. fast b. relatively medium c. slow d. too slow
2. When a current of 2 ampere pass through a conductor and the potential difference between its terminals is 220 volt, so the conductor resistance = ... ohm.
   a. 1100 b. 100 c. 110 d. 10
3. The chemical formula of nitrogen pentoxide is .....
   a. NO_2 b. N_5O_2 c. $5NO_2$ d. N_2O_5
4. From the peaceful uses of nuclear energy, the searching for petroleum and underground water in ..... field.
   a. agricultural b. drilling c. industrial d. medical

B To whom are the following works attributed :

1. Founder of genetics.
2. Discover the radioactivity phenomenon.
3. Discover a law in electricity which is known by his name.
4. The scientists who discovered the means of how the genes control the appearance of genetic traits.

C Which one is preferred, the alternating current or the direct current in lighting streets and houses ? and Why ?

22 Aswan Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

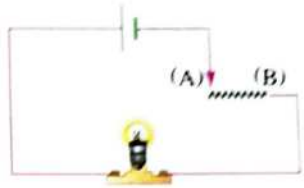
1. The electric current produced from the electrochemical cells is ..... current.
2. Every hereditary trait is controlled by two hereditary factors which separate during formation of the .....
3. The measuring unit of absorbed radiation is .....
4. The ..... traits are not transmitted from one generation to another.

B Choose from column (B), what suits it from column (A) :

(A)	(B)
1. The reaction of sodium with water	a. catalyst.
2. Glucagon hormone	b. stimulates the relase of glucose sugar from the liver.
3. Manganese dioxide	c. simple substitution.
4. Insulin hormone	d. double substitution.
	e. stimulates the storage of glucose sugar in liver.

C In the opposite circuit :

What happens to the intensity of light in the electric lamp when the slider of the rheostat moves from point (A) to point (B) ? and Giving a reason.



Question 2

A Choose the correct answer :

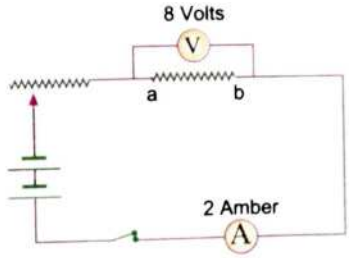
1. When sodium chloride solution reacts with silver nitrate ..... precipitate is formed.
   a. red b. white c. reddish brown d. blue
2. When electric current passes through across section of a conductor and current intensity 2 ampere in (10) seconds, so quantity of electricity passes equals ..... coulomb.
   a. 5 b. 10 c. 20 d. 30
3. Clear limewater turbid when passing ..... gas through it.
   a. nitrogen dioxide b. sulphur dioxide c. manganese dioxide d. carbon dioxide
4. The radioactive phenomenon was discovered by the scientist .....
   a. Ohm. b. Becquerel. c. Ampere. d. Mendel.

B Put (✓) in the front of correct statement and (✗) in the front of wrong one :

1. Copper replaces gold in it's salt solution, while the opposite doesn't occur. ( )
2. The ability of rolling the tongue is dominant trait in human being. ( )
3. The reaction of covalent compounds is faster than that of the ionic compounds. ( )
4. Mendel choose ten traits in pea plant to conduct his experiments. ( )

C From the opposite circuit :

Calculate the value of the electric resistance (ab).



Question 3

A Write the scientific term :

1. The charge which transmitted by a current with one ampere intensity in one second.

2. A chemical message that controls and regulates the activities and functions of most of the body organs.
3. The spontaneous decay of the atoms of some elements that are present in nature in an attempt to achieve a more stable composition.
4. The result when one of the endocrine glands does not act properly.

B Put these words in a suitable spaces :

(green – oxidization – zero % – reduction – yellow – 100 % – gene – chromosome)

1. A chemical process in which the atom loses an electron or more is known ..... process.
2. When pollinated a yellow seed pea plant with a green seed pea plant, they produce plants that are all with ..... seeds in the first generation.
3. The ..... is chemically consisted of a nucleic acid called DNA bind with the protein.
4. At the beginning of the chemical reaction, the concentration of reactants is .....

C From the following equation, answer :

$2\,(A) \xrightarrow{\Delta} 2NaNO_2 + (B)$

1. Write the chemical formula for (A).
2. Write the name of gas (B).

Question 4

A Correct the underlined words :

1. Most metal carbonates decompose by heating into **metal** and carbon dioxide.
2. Cosmic radiation is from **artificial** sources of radiation pollution.
3. $Mg + CuSO_4 \longrightarrow MgSO_4 + \mathbf{CuO}$.
4. The electromotive force of several cells which are connected in **series** is equal to the electromotive force of one cell.

B What the results of ... ?

1. Two charged conductors having the same electric potential are connected together by a conducting bar.
2. The individual who receive a recessive gene from both parents.
3. Increasing the value of resistance to double at a constant temperature (for the electric current intensity).
4. Mendel didn't remove the stamens of the flowers of the pea plant that produces yellow seeds.

C Compare between : Ammeter and voltmeter (according to its usage).

23 Red Sea Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. $Cu(OH)_2 \xrightarrow{\Delta}$ ..... + ...
2. In the electric generators (Dynamoes) ..... energy is converted into ..... energy.
3. From the factors that affect the speed of the chemical reaction are ..... and .....
4. The scientist who discovered radioactivity phenomenon is ....., and its unit is .....

B Complete the following table :

Point of comparison	Ionic compounds	Covalent compounds
1. The speed of chemical reaction	..... (1)	..... (2) .....
Point of comparison	Ammeter	Voltmeter
2. The way of connection in the electric circuit	..... (1)	..... (2) .....

C What happens if ... ?

1. Adding silver nitrate solution to sodium chloride solution.
2. Exposing a man for a large dosage of radiation for a short period of time.

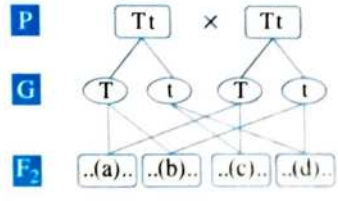
Question 2

A Correct the underlined words :

1. All metals are considered **oxidizing** factors.
2. When the amount of glucose sugar decreases in the blood, pancrease secretes **insulin** hormone.
3. Mendel removed the stamens from the flowers to prevent **cross** pollination in his expermints.
4. The electric current intensity passing through a conductor is **inversely** proportional to the potential difference.

B Complete the spaces :

1. The name of Mendel's first law is .....
2. The ratio of resulting generation ..... to .....
3. Write the symbol of the individual of resulting generation.



C **Give reasons for :**

1. Pituitary gland is called the master gland.
2. A red preciptate is formed when magnesium metal is added to copper sulphate solution.

Question 3

A **Choose the correct answer :**

1. Parts of DNA present in the nucleus of the cell are called .....
   a. gametes. b. genes. c. cytoplasm. d. protein.
2. At the beginning of the reaction, the percentage of the reactants concentration equals .....
   a. zero. b. 50 % c. 75 % d. 100 %
3. Clear limewater turbid when ..... gas pass through it.
   a. SO_3 b. H_2 c. CO_2 d. O_2
4. Arrangement of metallic elements in a descending order according to the degree of their chemical activity is called .....
   a. positive ions. b. negative ions.
   c. chemical activity series. d. neutral atom.

B **1. Write what the following graphics indicate :**

a. b. c. d.

2. Write the importance of (a) and (b) in the previous graphs.

C **If the work done needed to transfer a quantity of electricity 2 coulomb in a conductor equals 40 joule and its resistance equals 5 ohm.**

Calculate the current intensity passing in the conductor.

Question 4

A **Write the scientific term of the following statements :**

1. A chemical message that controls and regulates the activities of the body organs.
2. The traits that are not transmitted from one generation to another.
3. The enzyme which is found in sweet potato and acts as a catalyst which increases the rate of decomposition of hydrogen peroxide.
4. The reaction of an acid and alkali to give salt and water.

B Cross the odd word out :

1. Uranium – Cesium – Copper – Radium.
2. Coulomb / Second – Volt – Joule / Coulomb – Ampere × Ohm.
3. Dwarfism – Gigantim – Diabetes – Cancer.
4. Free ear lobe – Freckels – Wide eyes – Dimples.

C Mention the use of the following :

1. Ohmmeter.
2. The nuclear energy in the medical field.

24 North Sinai Governorate

Answer the following questions :

Question 1

A Put (✓) or (✗) in the front of the following statements :

1. Electrons are considered as energy store in an atom. ( )
2. The sliding rheostat is used to change the resistance value in an electric circuit. ( )
3. The chromosome is chemically consisted of nucleic acid called DNA bind with the protein. ( )
4. Mendel's second law is called the law of independent assortment of hereditary factors. ( )

B Find the unsuitable word or sentence and write what connects the rest of the words or sentences :

1. The nature of reactants – The concentration of products – The temperature of reaction – Catalysts.
2. Sodium – Potassium – Silver – Aluminium.
   (According to its position to hydrogen in the chemical activity series)
3. Testosterone – Calcitonin – Estrogen – Progesterone.
4. Growth hormone – Hormone activate the thyroid gland – Hormone activate the sexual glands – Insulin hormone.

C Compare between :

The direct current and the alternating current in terms of source and uses.

Question 2

A Complete the following sentences :

1. Covalent compounds have slow reactions because they take place between .....
2. Nitrogen pentoxide breaks up into nitrogen dioxide gas and ..... gas.

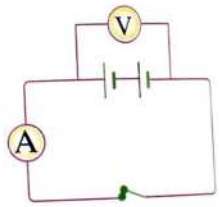
3. ..... is the charge transferred by a constant current of intensity equals one ampere in one second.
4. The measuring unit of absorbed radiation by the human body is the .....

B Choose the correct answer :

1. Double substitution reactions between salt solution are accompanied by the formation of .....
   a. a metal. b. a precipitate. c. an oxide. d. a non-metal.
2. In the reaction : $H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$
   The ..... process of copper oxide occurs.
   a. oxidation b. reduction c. dissolution d. double substitution
3. According to Mendel's first law, the hereditary factors are ..... when the gametes are formed.
   a. doubled b. combine c. segregate d. disappear
4. Genes control the appearance of a genetic traits of living organism by producing .....
   a. hormones. b. enzymes. c. fats. d. vitamins.

C In the opposite electric circuit :

What happens to the reading of each of the ammeter and voltmeter when the electric circuit is opened ? with mention of a reason.



Question 3

A Write the scientific term :

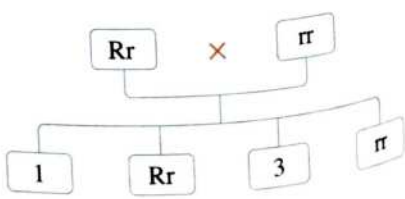
1. The state of an electric conductor that shows the transfer of the electricity from or to it, when it is connected to another conductor.
2. The changes that appear on a living organism as a result of exposure to radiation.
3. Organs secreting hormones in the human body.
4. Decrease of secretion in the growth hormone at the childhood.

B Frist : Complete the following equations and state the type of reaction :

1. $NaOH + HCl \longrightarrow NaCl +$ ..... (..... reaction)
2. $CuCO_3 \xrightarrow{\Delta} CuO +$ ..... (..... reaction)

Second : Study the opposite figure and then answer :

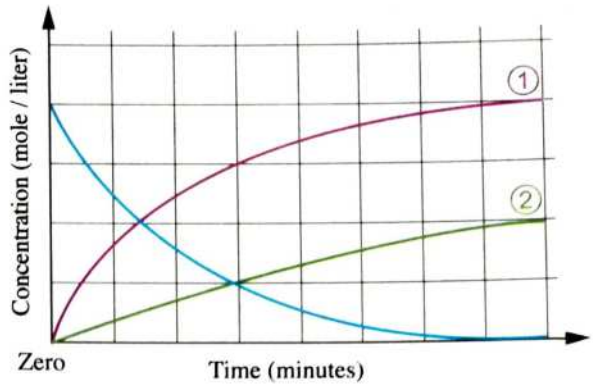
1. Replace the numbers (1) and (3) with the symbols of the members of the resulting generation.
2. The percentage of the recessive trait in the resulting generation is .....



C **The opposite graph shows :**

The decomposition of mercuric oxide by heat.

1. Write the balanced symbolic equation for this reaction.
2. Replace the numbers 1 and 2 on the figure by suitable substances from the equation.



Question 4

A **Correct the underlined words in the following statements :**

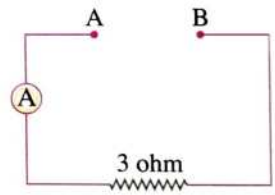
1. Some metals replace the hydrogen of water to form metal **carbonate**.
2. The substance which gains an electron or more during a chemical reaction is known as **a catalyst**.
3. In the electric cell, **kinetic** energy is converted into electric energy.
4. The nuclei of atoms of radioactive elements contain a number of **protons** more than the number required for its stability.

B **Choose from column (B), what suits it in column (A) :**

(A)	(B)
1. A device used to measure the intensity of electric current	a. the voltmeter.
2. A device used to measure the electric resistance	b. the dominate trait.
3. The trait of wide eyes	c. the Ammeter.
4. The trait that disappears in the first generation	d. the recessive trait.
	e. the ohmmeter.

C **In the opposite electric circuit :**

You have four similar electric cells the e.m.f. of each is 3 volts, are connected between points A and B to form a battery.



1. Calculate the e.m.f. of the battery to obtain an electric current of 3 amperes ?
2. Show by drawing the method of connecting them in the electric circuit between points A and B to obtain the same e.m.f. of the battery.

25 South Sinai Governorate

Answer the following questions :

Question 1

A **Choose the correct answer :**

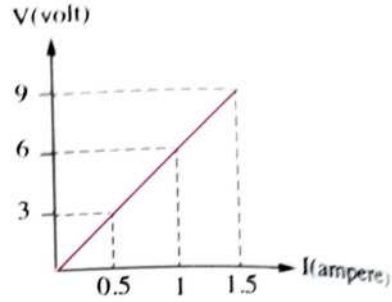
1. Which one of these traits is recessive in humans ? .....

a. Presence of dimples.
b. Narrow eyes.
c. Wide eyes.
d. Curly hair.

2. One of the properties of the direct current is .....
   a. constant value only.
   b. change direction only.
   c. change direction and value.
   d. constant value and direction.

3. According to Mendel's first law, the hereditary factors ..... when gametes are formed.
   a. doubled
   b. fuse
   c. segregate
   d. disappear

4. From the opposite graph, the resistance of the conductor equal ..... ohm.
   a. 1.5
   b. 4
   c. 6
   d. 18



B Put (✓) or (✗) for the following :

1. The decrease in thyroxin hormone due to lack of calcium in food causes simple goiter. ( )
2. $Fe + 2HCl \xrightarrow{dil.} Fe_2Cl_3 + H_2\uparrow$ ( )
3. Deficiency of growth hormones during childhood causes dwarfism. ( )
4. By using 3 gm of catalyst in a chemical reaction, its mass after finish the reaction equals 3 gram. ( )

C Study the opposite figure then answer :

Can an electric current pass through the conductor (wire) when it put in electric circuit from point (A) to (B) ? **With explanation ?**

Question 2

A Write the scientific term :

1. The opposition that electric current faces during its passing through a conductor.
2. The spontaneous decay of the atom's nuclei of some radioactive elements that are present in nature, in an attempt to achieve a more stable composition.
3. The change in the concentration of the reactants and resultants in a unit time.
4. The arrangement of metallic elements in a descending order according to the degree of their chemical activity.

B What happens when ... ?

1. Putting a piece of potato in a flask containing hydrogen peroxide.
2. Mendel remove the stamens of the flowers of the pea plant during his experiments before the anther becomes mature.
3. Adding silver nitrate solution to sodium chloride solution.
4. Pollination of peas with wrinkled seeds (rr) with smooth seed (Rr).

C Calculate the electric current intensity that flows through a cross-section of a wire if a charge of 5400 coulomb passes through in 5 hours.

Question 3

A Choose the odd word :

1. Coulomb – Joule – Volt – Second.
2. Pituitary gland – Salivary gland – Thyroid gland – Two adrenal glands.
3. Testosterone – Estrogen – Calcitonin – Progesterone.
4. Radium – Uranium – Sodium – Cesium.

B Choose from column (B), what suits it in column (A) :

(A)	(B)
1. Acquired traits	a. a red precipitate is formed.
2. When sodium react with water.	b. are transmitted from one generation to another.
3. Hereditary traits	c. aren't transmitted from one generation to another.
4. Adding magnesium to copper sulphate solution	d. hydrogen gas evolved.
	e. a white precipitate is formed.

C In the opposite reaction : $H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$

Determine the oxidizing agent and reducing agent.

Question 4

A Correct the underlined words :

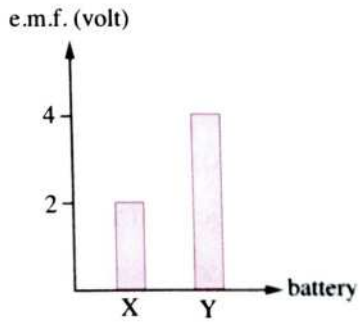
1. When heating of red mercuric oxide, **hydrogen** gas evolve.
2. **Curie** is the international unit of measuring the radiation absorbed by the human body.
3. At the beginning of the reaction the percentage of reactants concentration equal **50 %**.
4. **Digestive system** is the first which is affected by radiation.

B Complete :

1. Electric generators produce ..... current.
2. The chromosome chemically consists of a nucleic acid called .....
3. The sliding rheostat used to ..... in the electric circuit.
4. On pollination pea plant tall stem and red flowers (TTRR) with a pea plant short stem and white flowers (ttrr), so the genotype (TTRR)may be produced in their offspring at a percentage of .....

C The opposite graph represent the electromotive force of two batteries X and Y each of them consists of two similar electric cells e.m.f. each one 2 volt :

draw a diagrammatic figure for each battery



26 New Valley Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. ..... hormone is secreted when the percentage of glucose sugar increases in the blood.
2. When magnesium substitutes copper in a solution of its salts, ... precipitate is formed
3. Each gene gives a special ..... which is responsible for the occurrence of a chemical reaction.
4. The ..... effect of radiation is a result of changing the sex chromosomes of the cells.

B Compare between alternating current and direct current according to :

Points of comparison	Alternating current	Direct current
1. The source		
2. The use		

C Explain by symbolic and balanced chemical equations only what happens when :

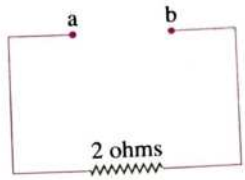
1. Adding diluted hydrochloric acid to copper.
2. Adding a small piece of sodium to water.

Question 2

A Choose the correct answer :

1. When the quantity of electric charge that passes through a cross section of a conductor decreased to half. So the current intensity.....
   a. increases four times. b. increases to double.
   c. decreases to quarter. d. decreases to half.
2. If the genetic structure of one of the parents is Bb and the other is bb, so the percentage of the appearance of the structure BB is ..... %.
   a. zero b. 25 c. 50 d. 75
3. In the following reaction $Cl_2 + 2e^- \longrightarrow 3Cl^-$ ..... process occurs to chlorine.
   a. oxidation b. reduction c. substitution d. decomposition
4. Calcitonin hormone regulates the level of ..... in the blood.
   a. potassium b. oxygen c. calcium d. iron

B If you have four similar electric cells the electromotive force for each one is 3 volts. Explain by drawing how to connect them together between the two points a and b in the opposite figure to obtain an electric current with intensity equals 4.5 amperes.



C **Give the reason for :**

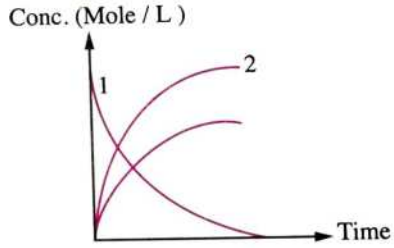
The reaction between sodium chloride solution and silver nitrate solution is from fast reactions.

Question 3

A **Write the scientific term :**

1. The cells through which the hereditary traits are transmitted from parents to the offsprings.
2. The reaction between an acid and an alkali to give the salt of acid and water.
3. Chemical substances regulate and organize most of the activities and functions of human body.
4. The electric current intensity produced by passing one coulomb of electric charge in one second through a conductor.

B **The opposite figure explains the change in the concentration of reactants and products of the thermal decomposition of sodium nitrate as time passes, complete the following :**



1. Curve (1) represents ..... compound which is known by its ..... colour.
2. Curve (2) represents ..... compound which is known by its ..... colour.

C **What happens when ... ?**

The length of wire of the sliding rheostat increases in the electric circuit according to the electric current intenslty.

Question 4

A **Correct the underlined words in the following statements :**

1. The nuclei of atoms of radioactive elements contain number of **protons** more than that required for their stability.
2. The electric resistance is measured by a device called **voltmeter**.
3. **Adrenaline** hormone promotes the growth of endometrium.
4. $Cu(OH)_2 \xrightarrow{\Delta} \mathbf{Cu} + H_2O$.

B 1. What is meant by Ohm's law ?

.....

.....

2. A work equals 1000 Joule is done to transfer a quantity of electricity equals 100 coulomb through a conductor in a time equals 20 seconds, calculate :

a. The current intensity passing in the conductor

.....

b. The potential difference between the terminals of the conductor.

.....

c. The electric resistance of the conductor

.....

C **Use the symbols to express the mating between a pea plant with hybrid yellow seeds Yy with another similar one, explaining :**

(the genetic structure of parents – gametes – the produced generation and its percentage).

27 Matrouh Governorate

Answer the following questions :

Question 1

A **Complete the following sentences :**

1. The catalyst change the speed of reaction, but don't affect either ..... or .....
2. The voltmeter appartaus connected in parallel with a battery to measure ..... in the open electric circuit, while it measure..... in the close one.
3. ..... with ..... for organizing body activates.
4. During Mendel's experiments, he removed the stamens form the flowers before they become mature to prevent ..... and he covered stigmas flowers to prevent .....

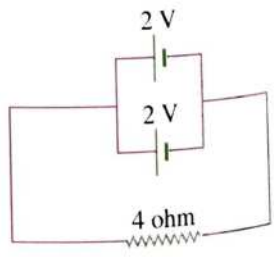
B **Complete the following chemical equation :**

$H_2 + CuO \xrightarrow{\Delta}$ ..... + ...

And determine (oxidizing agent , reducing agent) from this chemical equation.

C **In the opposite figure :**

Calculate the electric current intensity that flow through the electric circuit



Question 2

A **Choose the correct answer :**

1. Genes control the organism's genetic characteristics by producing .....

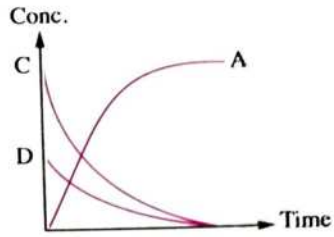
a. hormones. b. enzymes. c. fats. d. vitamins.

2. The apparatus used to control the value of electric current intensity in the circuit is the .....

a. ammeter. b. voltmeter. c. ohmmeter. d. rheostat.

3. The opposite graph represents the following reaction :

$$2Na + Cl_2 \longrightarrow 2NaCl$$



So the compound "NaCl" represented by ..... curve(s).

a. A b. C

c. D d. C , D

4. The radioactive phenomenon was discovered by the scientist .....

a. Gregor Mendel. b. Henry Becquerel. c. Ohm. d. Fred Hoyle.

B **Choose from column (B) what suits it in column (A) :**

(A)	(B)
1. Dominate trait	a. coulomb/sec.
2. Ampere	b. pure or impure.
3. Recessive trait	c. volt/ampere.
4. Ohm	d. always pure.

C **Give reasons for each of the following :**

1. Electric current will not flow between two charged conductors have the same electric potential.
2. Pituitary gland is called the master gland.

Question 3

A **Write the scientific term :**

1. They are ductless glands that secret their hormones directly in blood without passing through ducts.
2. It is the state of an electric conductor that show the transfer of electricity from or to it, when it is connected to another conductor.
3. The change in the concentration of the reactants and the resultants at a unit time.
4. It is the potential difference a cross two terminals of a conductor on doing a work of one joule to transfer a quantity of charge of one coulomb.

B **Compare between each of the following :**

1. Thyroxin hormone and calcitonin hormone (according to the function).
2. Wide eyes, narrow eyes. (according to the type of the hereditary trait).
3. Covalent compound, ionic compound. (according to the speed of reaction).
4. Direct electric current, alternating electric current. (according to the source).

C On pollination two pea plants the results are :

- 25 plants have tall stem "pure".
- 25 plants have short stem "pure".
- 50 plants have tall stem "impure".

Explain on a genetic principles the genetic composition for the parents

(Note : T for tall stem, t for short stem)

Question 4

A Correct the underlined words :

1. The electric current intensity is **indirectly** proportional to the electric potential of a conductor.
2. When **oxygen** gas flow through clear limewater, clear limewater becomes turbid.
3. The pea plant that have a genetic structure Tt Rr, the percentage of TR gametes equal **75 %**.
4. The e.m.f. of several cells which are connected in series is **less than** the e.m.f. of one cell.

B Choose the odd word or sentences :

1. Nature of the reactants – The concentration of the resultants – Temperature – Catalyst.
2. Coulomb / Sec. – Amper – Joule / Coulomb – Volt – Ohm.
3. Sodium – Lead – Copper – Aluminium.
4. Radium – Cesium – Polonium – Helium.

C Illustrate by balanced chemical equations :

1. Neutralization reaction "from you studied".
2. Adding of sodium carbonate to hydrochloric acid.

1 Cairo Governorate

1

(A) 1. acquired 2. parallel connection
3. pituitary 4. faster

(B) 1. b 2. a 3. d 4. c

(C) A white precipitate of silver chloride is formed.

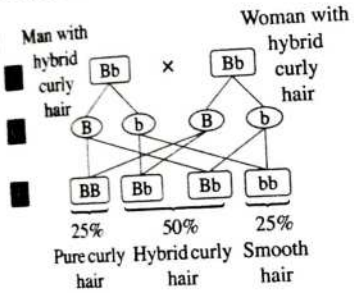
$$NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$$

2

(A) 1. hydrogen 2. the sum
3. positive 4. pure

(B) 1. Magnesium. 2. Product's volume.
3. Ohmmeter. 4. Gold.

(C)



3

(A) 1. The speed of chemical reaction.
2. The electric resistance.
3. Endocrine glands.
4. Electric potential of a conductor.

(B) 1. Gregor Mendel. 2. Ohm.
3. Henri Becquerel. 4. Badel and Tatum.

(C) $V = \frac{w}{q} = \frac{22000}{200} = 110$ volt

4

(A) 1. d 2. a 3. c 4. b

(B) 1. the alternative electric current.
2. the electric generator (dynamo).
3. adrenal gland.
4. adrenalin hormone.

(C) $2Na \xrightarrow{\text{Oxidation}} 2Na^+ + 2e^-$

$Cl_2 + 2e^- \xrightarrow{\text{Reduction}} 2Cl^-$

2 Giza Governorate

1

(A) 1. (✗) 2. (✓) 3. (✗) 4. (✓)

(B) 1. a 2. c 3. d 4. d

(C) This means that the potential difference across the two poles of this conductor equals $\frac{64}{8} = 8$ volt.

2

(A) 1. The electromotive force.
2. The speed of chemical reaction.
3. Radioactive elements.
4. Simple substitution reactions.

(B) 1. copper oxide 2. rryy
3. decreasing 4. dominant

(C) This will lead to :
- Feeling of being sick
- Sore throat accompanied by nausea, vertigo and diarrhea.

3

(A) 1. blood 2. 4.5 3. dwarfism 4. rheostat

(B) **First :**

1. $Na_2CO_3 + 2HCl \xrightarrow{\text{dil.}} 2NaCl + H_2O + CO_2\uparrow$

2. $2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + \text{heat}$

Second :

1. Difficult to plant 2. Skin colour

(C) The speed of chemical reaction increases.

4

(A) 1. c 2. d 3. a 4. b

(B) **Fig. (1) :** 1. 6 ohm

2. The ratio between the potential difference across the two ends of the conductor and the current intensity passing through it.

Fig. (2) : 3. Rr

4. Because the red flower trait dominates over the white flower trait in pea plants, according to the principle of complete dominance.

(C) Because this reaction occurs by losing and gaining electrons.

3 Alex. Governorate

1

(A) 1. manganese dioxide - sweet potato.
2. dominant 3. ammeter

(B) 1. b 2. c 3. c 4. d

(C) 1. Because the surface area in case of iron filings is larger than that in case of iron piece, and the speed of chemical reactions increases by increasing the surfaces area.
2. Because radiation causes changes in the sex chromosomes composition for living organisms.

2

(A) 1. Oxidation process. 2. Acquired traits.
3. Catalyst. 4. Hormones.

(B) 1. $NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$ white ppt.

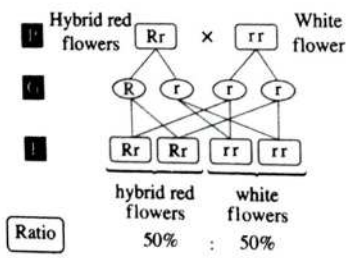
2. $Na_2CO_3 + 2HCl \xrightarrow{dil.} 2NaCl + H_2O + CO_2\uparrow$

(C) 1. It is used for measuring :
a. The potential difference across two ends of a conductor.
b. The electromotive force of the battery.
2. - It changes the kinetic energy into electric energy.
- It produces alternating current.

3

(A) 1. independent assortment of hereditary factors.
2. variable 3. iron rust. 4. equal to

(B)



(C) ***Look at the main book on page* (159).**

4

(A) 1. (✗) ... and water vapour.
2. (✗) ... in the nucleus of the cell.
3. (✓) 4. (✓)

(B) 1. Dwarfism. 2. Exophthalmic goiter.

(C) $\because I = \frac{V}{R} = \frac{220}{2200} = 0.1$ ampere
$\therefore q = I \times t = 0.1 \times 120 = 12$ coulomb

4 Qalyoubia Governorate

1

(A) 1. b 2. c 3. a 4. d

(B) 1. Simple goiter. 2. $AgNO_3$
3. Progesterone
4. Copper oxide and water vapour

(C) $\because V = R \times I = 4 \times 3 = 12$ volt
$\therefore$ The value of (X) and (Y) $= 12 - 2 = 10$ volt
$\therefore$ The value of (X) or (Y) $= \frac{10}{2} = 5$ volt

2

(A) First :
1. Coulomb / Second, the rest words are : units of measuring resistance.
2. Gigantism, the rest words are : Diseases resulting from the decrease in the secretion of some hormones.

Second :
1. It is used to control the current intensity and potential difference in the electric circuit.
2. They are necessary to bind the nuclear components together, to overcome the repulsion forces that are present between the positively charged protons.

(B) First :
1. CuO 2. Cu 3. CO_2
2. By passing it through clear limewater for a short time, it becomes turbid.

Second :
1. Growth hormone. 2. Pituitary gland. 3. Ovaries.
4. Secret estrogen and progesterone hormones.

(C) 1. $\because q = I \times t = 3 \times 2 = 6$ coulomb
$\therefore W = V \times q = 60 \times 6 = 360$ Joule

2. $R = \frac{V}{I} = \frac{60}{3} = 20$ ohm

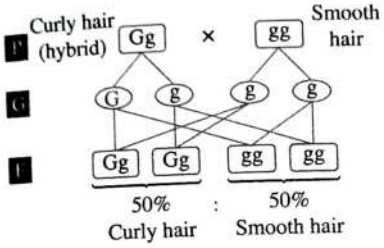
3

(A) First :
1. Al_2O_3 2. H^+

Second :

1. Because the double substitution reactions occur between the ions without losing or gaining electrons.
2. Because when man exposed to emergency, the adrenal gland secretes adrenalin hormone, which stimulates pancreatic gland to secrete glucagon hormone, that stimulate the release of glucose sugar from liver as a responce to emergency.

(B) First :



Second :

1. No electric current will pass through them.
2. This cause disease symptoms which is know as hormone disorder.

(C) 1. (4) 2. (1) 3. (2) 4. (3)

4

(A) 1. Positive hydrogen ions.
2. Parallel connection.
3. Blood. 4. Electrochemical cells.

(B) First :

1. Ali Mostafa Moshrafa. 2. Genes

Second :

1. - The direct current : it cannot be transferred for long distances.
   - The alternating current : it can be transferred for long distances.
2. - Mendel's first law : named law of segregation of factors.
   - Mendel's second law : named law of independent assortment of hereditary factors.

(C) 1. Increase the concentration of HCl 2. Mg

5 Menofia Governorate

1

(A) 1. Voltmeter.
2. Recessive trait.
3. The principle of complete dominance.
4. Artificial radioactivity

(B) 1. The human suffers from simple goiter.
2. A white precipitate of silver chloride is formed

$$NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$$

3. The human will suffer from diabetes disease.
4. The speed of chemical reaction decreases.

(C) $\because q = I \times t = 5 \times 2 = 10$ coulomb

$$\therefore V = \frac{w}{q} = \frac{200}{10} = 20 \text{ volt}$$

2

(A) 1. f 2. e 3. a 4. c

(B) 1. The speed of chemical reaction.
2. concurrent 3. protein.
4. curly or black

(C) 1. Decrease 2. Increase

3

(A) 1. Aluminium. 2. Rheostat. 3. Adrenalin.
4. Long sightedness.

(B) 1. the metal oxide 2. seven 3. two
4. law of segregation of factors.

(C) Because the reactions of covalent compounds take place between molecules and can't form ions after dissolving in water.

4

(A) 1. c 2. b 3. a 4. d

(B) 1. (✓) 2. (✗) 3. (✗) 4. (✓)

(C) $R = \frac{V}{I} = \frac{(8+4)}{4} = \frac{12}{4} = 3$ ohm

6 Dakahlia Governorate

1

(A) 1. alternating – direct 2. $2NaCl - CO_2$
3. sievert – joule 4. thyroxin – simple goiter

(B) Firstly :

1. C & D 2. A 3. B

Secondly :

$$2C + D \xrightarrow{B} 2A$$

(C) $\because V = R \times I = 10 \times 2 = 20$ volt

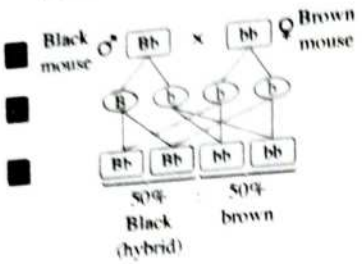
$\therefore W = v \times q = 20 \times 40 = 800$ Joule

2

(A) 1. c 2. b 3. d 4. c

(B) 1. independent assortment of hereditary factors.
2. Red 3. electric resistance. 4. glucagon

(C)



3

(A) 1. The electromotive force. 2. Hybrid individual.
3. Catalyst. 4. Acquired traits.

(B) 1. (A) $CuSO_4$ (B) CuO (C) Cu
2. Reduction process

(C) ∵ $V = R \times I = 3 \times 2 = 6$ volt
∴ $E = 6 - 2 = 4$ volt

4

(A) 1. Because it secretes hormones that regulate the activities of most of other endocrine glands.
2. Because aluminium comes before silver in the chemical activity series, so it substitutes silver in silver nitrate solution which leads to eroding of aluminium containers.
3. Because by increasing the length of conductor, the resistance increases and the current intensity is inversely proportional to the resistance.
4. Because the nucleus of its atom contains a number of neutrons more than the number required for its stability which causes the presence of excess energy emitted in a form of unseen radiation.

(B) 1. This may lead to the damage of bone marrow, spleen, digestive system and central nervous system.
2. No reaction occurs.
3. The body stop growing, so the person becomes dwarf.
4. The hybrid dominant trait appears.

(C) 1. Adrenal gland.
2. it secretes adrenalin hormone which stimulates body's organs to respond to emergencies.
3. variable resistance (rheostat).
4. It is used to control the current intensity and potential difference in the electric circuit.

7 Sharkia Governorate

1

(A) 1. Work. 2. Hybrid individual.
3. The electric current. 4. Acquired trait.

(B) 1. hydrogen – oxygen 2. sodium – chlorine.
3. glucagon 4. diabetes – insulin

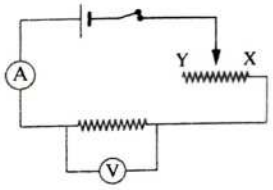
(C) ∵ $q = I \times t = 0.5 \times (5 \times 60) = 150$ Coulomb
∴ $W = v \times q = 12 \times 150 = 1800$ Joule

2

(A) 1. sulphur trioxide gas 2. direct
3. 2HCl 4. three

(B) 1. a 2. a 3. d 4. b

(C)



- The rheostat slider must be moved toward (Y) to decrease the reading of both devices Ⓐ & Ⓥ, as the resistance increases by increasing the length of metallic wire coil, thus the value of I & V decreases.

3

(A) 1. (✓) 2. (✓) 3. (✗) 4. (✗)

(B) 1. Temperature of reaction, the remain words are : The factors affecting the nature of the reactants.
2. Free ear lobe, the remain words are : Recessive traits.
3. Simple substitution reaction, the remain words are : Double substitution reactions.
4. Speaking in many languages, the remain words are : Hereditary traits.

(C) The blue colour of copper sulphate disappears and a red precipitate of copper is formed.

$$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$$

4

(A) 1. b 2. c 3. b 4. c

(B) 1. c 2. d 3. a 4. b

(C) 1. 4 + 4 = 8 volt 2. $I = \frac{V}{R} = \frac{8}{4} = 2$ ampere

8 Gharbia Governorate

1

(A) 1. protein. 2. potential difference
3. recessive 4. uranium

(B) 1. (✗) 2. (✓) 3. (✗) 4. (✗)

(C) ∵ $V = R \times I = 100 \times 2 = 200$ volt

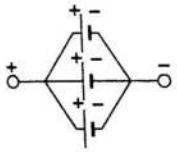
∴ $W = V \times q = 200 \times 10 = 2000$ Joule

2

(A) 1. d 2. b 3. a 4. c

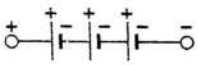
(B) 1. stamens 2. ions 3. gene 4. increasing

(C) 1.



1.5 volt

2.



4.5 volt

3

(A) 1. Endocrine glands. 2. The electric current.
3. Hormone. 4. The electric resistance.

(B) 1. An ignition occurs accompanied by a strong pop sound

$$2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + heat$$

2. The reaction which results in a protein showing a specific hereditary trait will not occur.
3. The speed of chemical reaction increases.
4. They produce a generation carries the hybrid dominant trait only.

(C) 1. Adding magnesium ribbon to copper sulphate solution

$$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$$

2. Heating of mercuric oxide

$$2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$$

4

(A) 1. natural 2. oxygen
3. ammeter. 4. oxidizing agent.

(B) 1. g 2. d 3. e 4. f

(C) ***Look at the main book on page* (127).**

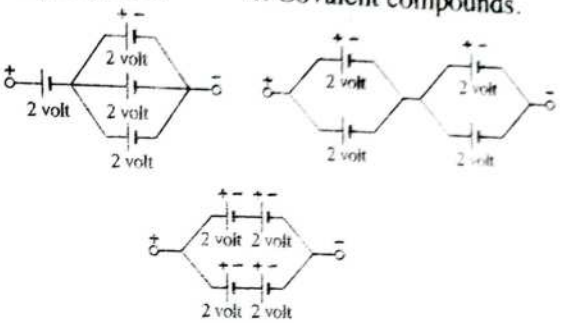
9 Damietta Governorate

1

(A) 1. silicon sheets. 2. joule.
3. genes. 4. acquired traits.

(B) 1. Hormone. 2. Reduction process.
3. Simple goiter. 4. Covalent compounds.

(C) 1.



2. No electric current will pass through them because there is no potential difference between them.

2

(A) 1. copper oxide 2. one ohm.
3. negative catalyst 4. bone marrow.

(B) 1. a 2. d 3. c 4. b

(C) Fig. (1) : - potential difference.
- e.m.f of the battery

Fig. (2) : The lamp lighting increases because the current intensity increases, as it is inversely proportional to the length of wire.

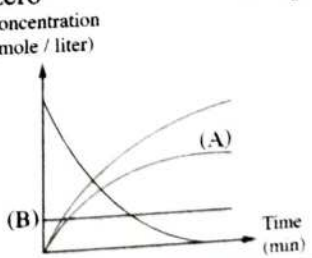
3

(A) 1. glucagon 2. 15 joule 3. blood. 4. neutrons

(B) 1. (✗) 2. (✗) 3. (✓) 4. (✗)

(C) (a) 1. zero 2. O_2

(b)



4

(A) 1. c 2. d 3. a 4. b

(B) 1. Recessive trait. 2. Electrochemical cells.
3. Enzyme. 4. Natural radioactivity.

(C) 1. (a) B (b) $R = \frac{V}{I}$

2. The direct electric current will pass through the wire.

10 Kafr El-Sheikh Governorate

1

(A) 1. direct
2. thyroxin
3. a precipitate.
4. black

(B) 1. Chemical activity series.
2. The coulomb.
3. Dominant trait.
4. Genes.

(C) *Look at the main book on page* **(25).**

2

(A) 1. d 2. b 3. d 4. d

(B) 1. kinetic 2. natural 3. metal oxide 4. nucleus

(C) The blue colour of copper sulphate disappears and a red precipitate of copper is formed.

$$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$$

3

(A) 1. (✓) 2. (✓) 3. (✓) 4. (✗)

(B) 1. Hydrogen is oxidized into water, while copper oxide is reduced into copper.

$$H_2 + CuO \xrightarrow{\Delta} H_2O + Cu$$

2. An effervescence occurs due to evolving of carbon dioxide gas bubbles.

$$Na_2CO_3 + 2HCl \xrightarrow{dil.} 2NaCl + H_2O + CO_2\uparrow$$

(C) $\because q = I \times t = 5 \times 10 = 50$ coulomb

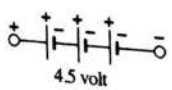
$\because V = \frac{w}{q} = \frac{200}{50} = 4$ volt

4

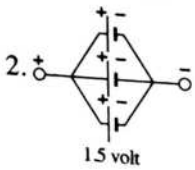
(A) 1. Because the low temperature in the fridge slows down the speed of the chemical reactions done by bacteria which cause the rot of food.

2. To be sure of the purity of this trait.

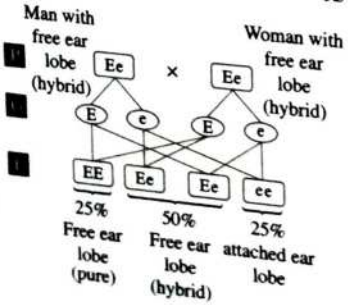
(B) 1.



2.



(C)



11 Behiera Governorate

1

(A) 1. c 2. a 3. c 4. b

(B) 1. Catalytic converter. 2. The electric resistance.
3. Acquired traits.
4. The speed of chemical reaction.

(C) 1. Because it can be transferred for long distances through wires and it can be changed into a direct current.

2. Because the gene of the free ear lobe dominates over the gene of the attached ear lobe if they are both present together in an individual.

2

(A) 1. (✗) 2. (✗) 3. (✓) 4. (✗)

(B) 1. The concentration of products / Factors affecting the speed of chemical reaction.
2. Manufacturing the nuclear bomb / The peaceful uses of nuclear energy.
3. Cancer / Diseases resulting from hormone disorders.
4. Salivary glands / Endocrine glands.

(C) 1. $CuSO_4 \xrightarrow{\Delta} CuO + SO_3\uparrow$

2. $Na_2CO_3 + 2HCl \xrightarrow{dil.} 2NaCl + H_2O + CO_2\uparrow$

3

(A) 1. red
2. neutrons
3. 25%
4. sliding rheostat.

(B) 1. $NaNO_3 + AgCl\downarrow$
2. thyroxin
3. insulin
4. $ZnCl_2 + H_2\uparrow$

(C) $V = R \times I = 60 \times 0.1 = 6$ volt.

$\because E_{battery} = n \times E_1$

$6 \text{ volt} = n \times 1.5$

$\therefore$ The number of cells $= \frac{6}{1.5} = 4$ cells.

4

(A) 1. d → n 2. e → m 3. a → z 4. b → a

(B) **First :**

1. Watson and Crick.
2. Gregor Mendel.

Second :

1. H_2
2. Na

(C) $t = 5 \times 60 = 300$ sec.

$I = \frac{q}{t} = \frac{3600}{300} = 12$ ampere

12 Ismailia Governorate

1

(A) 1. ammeter – ampere.

2. Electrochemical cell – alternating

3. dominant – recessive

4. (1) YYrr – (2) YyRR

(B) 1. calcium 2. brain.

3. chemical activity. 4. petroleum oil

(C) $V = \frac{w}{q} = \frac{3330}{30} = 111$ volt

2

(A) 1. c 2. a 3. c 4. b

(B) 1. ***Look at the main book on page* (23).**

2. - The reactions of ionic compounds are fast.
   - Most of the reactions of covalent compounds are slow.

3. ***Look at the main book on page* (188).**

4. - **Mendel's first law :** one pair of contrasting traits.
   - **Mendel's second law :** Two pairs or more of contrasting traits.

(C) The electric current will flow from the conductor that has the higher electric potential (A) to the other (B).

3

(A) 1. (✓) 2. (✗) 3. (✗) 4. (✓)

(B) 1. c 2. e 3. b 4. a

(C) 1. (X) : NaCl 2. (X) : NaCl , (Y) : $NaNO_3$

4

(A) 1. Simple Substitution reactions.

2. Catalyst.

3. The electric current.

4. Radioactive elements.

(B) 1. It is used for measuring :
   - The potential difference across two ends of a conductor.
   - The electromotive force of the battery.

2. It is used in lighting houses and in operating of electric appliances.

3. Solving the problem of malnutrition caused by deficiency of vitamin (A).

4. They are responsible for appearing the individual's hereditary traits.

(C) remains constant.

13 Suez Governorate

1

(A) 1. a 2. c 3. a 4. b

(B) 1. The rate of decomposition of hydrogen peroxide increases.

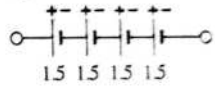
2. Hydrogen is oxidized into water, while copper oxide is reduced into copper.

$$H_2 + CuO \xrightarrow{\Delta} Cu + H_2O\uparrow$$

3. The body stops growing, so the person becomes a dwarf.

4. The level of glucose sugar in blood decreases.

(C) e.m.f. = 6 volt



2

(A) 1. Thermal decomposition reactions.

2. Oxidation process.

3. Nuclear binding forces.

4. Radioactivity phenomenon.

(B) 1. chloride 2. increasing 3. hybrid 4. (1 : 1)

(C) 1. $I = \frac{q}{t} = \frac{30}{60} = 0.5$ ampere 2. 2 volt

3

(A) 1. directly 2. genetic 3. O_2 4. thyroxin

(B) 1. Because the reactions of covalent compounds take place between molecules, while the reactions of ionic compounds take place between ions.

2. Because magnesium comes before copper in the chemical activity series, so it replaces copper in copper sulphate solution, and copper precipitates as a red ppt.

$$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$$

3. ***Look at the main book on page* (182).**

4. Because the target cells that are affected by hormone are located faraway from endocrine glands, so blood is the only way for the hormones to reach them.

(C) 1. $Zn + 2HCl \xrightarrow{dil.} ZnCl_2 + H_2\uparrow$

2. No reaction occurs.

4

(A) 1. Concentration of resultants. 2. Sodium
3. Ampere 4. Aluminium

(B) 1. an oxidizing. 2. neutralization
3. acquired traits. 4. enzyme.

(C) (A) Electrochemical cells.
(B) Electric generator (Dynamoe)

14 Port Said Governorate

(A) **(1)** a **(2)** c **(3)** b **(4)** a
(5) c **(6)** a **(7)** d **(8)** d
(9) b **(10)** b **(11)** c **(12)** b
(13) a **(14)** d **(15)** a **(16)** b
(17) b **(18)** c **(19)** b **(20)** d
(21) c **(22)** b **(23)** c **(24)** b
(25) a **(26)** d **(27)** a **(28)** b

(B) **(29)** $R = \frac{V}{I} = \frac{6}{2} = 3$ ohm

(30) $q = I \times t = 2 \times 30 = 60$ coulomb

(31) The nuclei of this element (radioactive element) become unstable.

(32) Because by increasing the number of reactants molecules, the number of probable collisions between them increases, so the speed of reaction increases.

(33) ***Look at the main book on page* (128).**

(34) Iron filing will rust faster than a wire of iron as the speed of chemical reaction increases by increasing the surface area of the reaction exposed to reaction.

15 Fayoum Governorate

1

(A) 1. direct – alternating 2. the cells – hemoglobin
3. acquired – hereditary
4. side position – end position

(B) 1. hydroxide. 2. increases.
3. thyroid 4. Glucagon

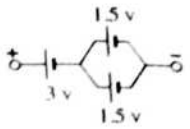
(C) 1. Resistance (R) 2. Quantity of charge (q)

2

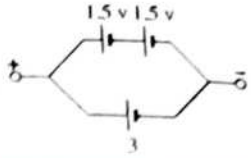
(A) 1. Dominant trait. 2. Hybrid individual.
3. Electric potential of a conductor.
4. Series connection.

(B) 1. (✗) 2. (✓) 3. (✓) 4. (✓)

(C) **First :** 4.5 volt



Second : 3 volt



3

(A) 1. c 2. a 3. d 4. b

(B) 1. oxidation.
2. speed of chemical reaction.
3. segregation of factors. 4. recessive.

(C) 1. $NaCl + AgNO_3 \longrightarrow NaNO_3 + \underset{\text{white ppt.}}{AgCl\downarrow}$

2. $Na_2CO_3 + 2HCl \xrightarrow{\text{dil.}} 2NaCl + H_2O + CO_2\uparrow$

4

(A) 1. a 2. a 3. c 4. b

(B) 1. work. 2. Nuclear bombs.
3. Formation of petroleum oil.
4. Manganese dioxide.

(C) $\because I = \frac{q}{t} = \frac{6}{3} = 2$ ampere

$\therefore R = \frac{V}{I} = \frac{4}{2} = 2$ ohm

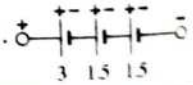
16 Beni-Suef Governorate

(A) 1. a 2. c 3. b 4. b

(B) **First** : 1. false 2. $H_2\uparrow$
Second : 1. Insulin 2. Diabetes

(C) 1. e.m.f = 4.5 volt

2.



2

(A) 1. oxidation process. 2. electrochemical cells.
3. catalyst. 4. industrial

(B) **First :**
1. The evolved gas in Tube (1) : CO_2
2. Double substitution reaction (neutralization)

Second :
1. (1) RR , (2) rr 2. (X)

(C) $V = \frac{w}{q} = \frac{660}{3} = 220$ volt

3

(A) 1. The two testes. 2. Adrenalin.
3. Electric current intensity.
4. Radiation pollution.

(B) 1. Gregor Mendel 2. Hybrid
3. ions. 4. white

(C) 1. $2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + heat$
2. It burns with a pop sound.

4

(A) 1. (✗) 2. (✗) 3. (✗) 4. (✗)

(B) 1. the potential difference. 2. Chromosome
3. wrong 4. oxygen

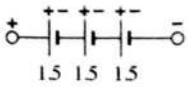
(C) 1. Ohm's law
2. The electric current intensity passing through a conductor is directly proportional to the potential difference across it at a constant temperature.

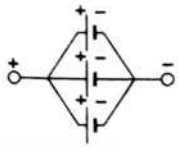
17 Minia Governorate

1

(A) 1. The electric current. 2. The electric resistance.
3. Genes. 4. Hybrid individual.

(B) 1. (✓) 2. (✗) 3. (✗) 4. (✓)

(C) First : 4.5 volt 

Second : 1.5 volt 

2

(A) 1. neutralization 2. Nucleus
3. radium 4. catalytic converter

(B) 1. The concentration of the products reaches to 100%
2. Oxygen gas evolves which increases the glow of the lightened stick
3. The individuals of the first generation carry the dominant trait at a ratio of 100%, while the two traits appear in the second generation at a ratio of 3 (dominant trait) :1 (recessive trait).
4. The reaction which results in a protein showing a specific hereditary trait will not occur.

(C) $t = 10 \times 60 = 600$ sec.

$I = \frac{q}{t} = \frac{6000}{600} = 10$ ampere

3

(A) 1. the blood. 2. rheostate
3. Progesterone 4. alternating

(B) 1. d 2. b 3. a 4. e

(C) 1. $CuSO_4 \xrightarrow{\Delta} CuO + SO_3\uparrow$
2. $H_2 + CuO \xrightarrow{\Delta} H_2O + Cu$

4

(A) 1. d 2. b 3. d 4. a

(B) 1. To prevent pollution of the underground water.
2. To get rid of the excess energy to achieve a more stable composition.
3. Because rice doesn't contain pro-vitamin(A) that is known as carotene, which is converted into vitamin (A) inside the body.
4. Because it is acquired trait that can't be transmitted from a generation to another.

(C) ***Look at the main book on page* (129).**

18 Assuit Governorate

1

(A) 1. directly 2. cross (mixed)
3. 20 4. segregate

(B) 1. (✓) 2. (✗) 3. (✗) 4. (✗)

(C) e.m.f. $= 2 + 2 + 2 + 2 = 8$ volt

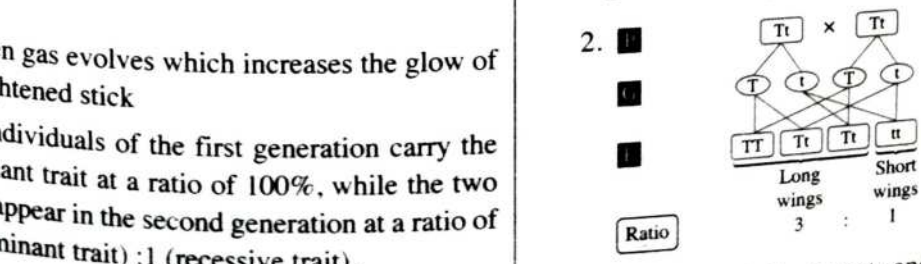
$I = \frac{V}{R} = \frac{8}{4} = 2$ ampere

2

(A) 1. b 2. d 3. c 4. d

(B) 1. A. $NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$

B. $2HCl + Na_2CO_3 \longrightarrow 2NaCl + H_2O + CO_2\uparrow$

2. 

(C) It is used to eliminate pests and to improve some plants races.

3

(A) 1. a. (1) – electric generator.

b. direct current – electrochemical cells.

2. a. (Z) – insulin. b. (X) – glycogen

(B) 1. Recessive trait 2. Speed of chemical reaction

3. Enzyme 4. Oxidation process

(C) Because the low temperature in the freezer slows down the speed of the chemical reactions done by bacteria which cause the rot of food.

4

(A) 1. e 2. d 3. b 4. a

(B) 1. The genetic effects .....

2. Mendel chose seven traits .....

3. Electric potential of a conductor .....

4. True statement

(C) - The electric current intensity decreases

- The resistance increases

19 Sohag Governorate

1

(A) 1. series 2. direct electric

3. Hereditary traits 4. Chromosome

(B) 1. c 2. e 3. d 4. a

(C) $V = R \times I = 22 \times 10 = 220$ volt

2

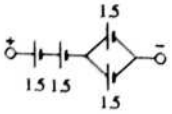
(A) 1. Thermal decomposition reactions.

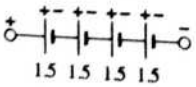
2. Reduction

3. Electric current intensity

4. Sievert

(B) 1. (✗) 2. (✗) 3. (✗) 4. (✓)

(C) a. 4.5 volts 

b. 6 volts 

3

(A) 1. a 2. b 3. a 4. c

(B) 1. Oxidizing agent : CuO , Reducing agent : H_2

2. (a) Rr

(b) rr

(C) - $Zn + 2HCl_2 \xrightarrow{dil.} ZnCl_2 + H_2\uparrow$

- Simple substitution reaction.

4

(A) 1. faster 2. double substitution

3. kinetic 4. Physical effects

(B) 1. The electromotive force

2. Electric resistance 3. The dominant trait

4. segregation of factors

(C) Because by increasing the number of reactants molecules, the number of probable collisions between them increases, so the speed of reaction increases.

20 Qena Governorate

1

(A) 1. self 2. alternating

3. acquired 4. Sievert

(B) 1. (✗) 2. (✓) 3. (✓) 4. (✗)

(C) $\because V = R \times I = 5 \times 2 = 10$ volt

$\therefore W = V \times q = 10 \times 50 = 500$ Joule

2

(A) 1. Speed of chemical reaction 2. Coulomb

3. Artificial radioactivity 4. Oxidase enzyme

(B) 1. salt 2. 100% 3. parallel 4. nucleus

(C) Due to formation of silver chloride salt which doesn't dissolve in water.

$$NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$$

3

(A) 1. A. 6 volt B. 4 volt

2. A. (X) Glucagon hormone.

B. (X) Insulin hormone.

(B) 1. $\frac{\text{Joule}}{\text{coulomb}}$ 2. Root length 3. Barium

4. The presence of dimples in the face

(C) - Reactions between ionic compounds are fast

- Reactions between covalent compounds are slow.

4

(A) 1. b 2. a 3. d 4. c

(B) 1. b 2. d 3. c 4. a

(C) 1. $Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$

2. $CuSO_4 \xrightarrow{\Delta} CuO + SO_3$

$H_2 + CuO \xrightarrow{\Delta} H_2O + Cu$

21 Luxor Governorate

1

(A) 1. voltmeter 2. acquired
3. chemical 4. chromosome

(B) 1. equal 2. Pancreas
3. $FeCl_2$ 4. growth hormone

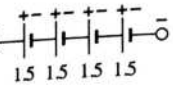
(C) $I = \frac{q}{t} = \frac{540}{60} = 9$ ampere

2

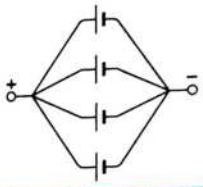
(A) 1. Electric current 2. Chemical activity series
3. Sievert 4. Speed of chemical reaction

(B) 1. (✓) 2. (✗) 3. (✗) 4. (✓)

(C) • 6 volt



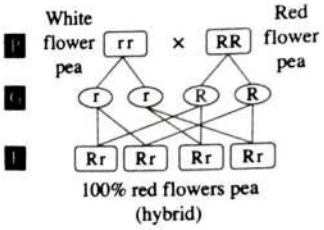
• 1.5 volt



3

(A) 1. c 2. e 3. a 4. b

(B) 1. **First :**



Second : zero %

2. **First :** Thermal decomposition reaction
Second : Oxygen gas.

(C) ***Look at the main book on page* (25).**

4

(A) 1. a 2. c 3. d 4. b

(B) 1. Gregor Mendel 2. Henri Becquerel
3. Ohm 4. Badel and Tatum

(C) The alternating current, because it can be transferred for long distances through wires and it can be changed into a direct current.

22 Aswan Governorate

1

(A) 1. direct 2. gametes
3. sievert 4. acquired

(B) 1. c 2. b 3. a 4. e

(C) The light of electric lamp increases, because the length of electric wire decreases so the electric resistance decreases and the electric current increases.

2

(A) 1. b 2. c 3. d 4. b

(B) 1. (✓) 2. (✓) 3. (✗) 4. (✗)

(C) $R = \frac{V}{I} = \frac{8}{2} = 4$ ohm

3

(A) 1. Coulomb 2. Hormone
3. Radioactivity phenomenon
4. Hormone disorder

(B) 1. oxidation 2. yellow
3. chromosome 4. 100%

(C) 1. $2NaNO_3$ 2. Oxygen (O_2)

4

(A) 1. metal oxide 2. natural
3. Cu↓ 4. parallel

(B) 1. No electric current will pass through them.
2. The produced individual bears recessive trait.
3. The electric current intensity decreases to its half.
4. The self pollination occurs.

(C) ***Look at the main book on page* (94).**

23 Red Sea Governorate

1

(A) 1. $CuO + H_2O\uparrow$ 2. kinetic – electric
3. Nature of the reactants – reactants concentration
4. Henri Bequerel – Sievert.

(B) 1. (1) fast , (2) slow
2. (1) series , (2) parallel

(C) 1. A white precipitate of silver chloride is formed.

$NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$

2. This may lead to the damage of bone marrow, spleen, digestive system and central nervous system.

2

(A) 1. reducing 2. glucagon 3. self 4. directly

(B) 1. segregation of factors

2. (3 dominant : 1 recessive)

3. (a) TT (b) Tt (c) Tt (d) tt

(C) 1. Because it secretes hormones that regulate the activities of most of other endocrine glands.

2. Because magnesium comes before copper in the chemical activity series, so it replaces copper in copper sulphate solution and copper precipitates as a red ppt.

$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$

3

(A) 1. b 2. d 3. c 4. c

(B) (1) a. Variable resistance b. Voltmeter

c. Direct electric current d. Series connection

(2) a. Variable resistance : is used to control the electric current intensity flowing through the circuit and the potential difference in the different parts of the circuit.

b. Voltmeter : is used to measure the e.m.f of an electric source and the potential difference between two points in an electric circuit.

(C) $\because V = \frac{W}{q} = \frac{40}{2} = 20$ volt

$\therefore I = \frac{V}{R} = \frac{20}{5} = 4$ ampere

4

(A) 1. Hormone 2. Acquired traits

3. Oxidase enzyme

4. Neutralization reaction

(B) 1. Copper 2. Coulomb / Second

3. Cancer 4. Freckels

(C) 1. It is used for measuring the electric resistance.

2. It is used to treat and diagnose diseases like cancer.

24 North Sinai Governorate

1

(A) 1. (✗) 2. (✓) 3. (✓) 4. (✓)

(B) 1. The concentration of products, the others are factors affecting the speed of chemical reactions

2. Silver, the others are : metals precede hydrogen in C.A.S.

3. Calcitonin, the others are : Sexual hormones

4. Insulin hormone, the others are : Hormones secreted by pitutary gland.

(C) *Look at the main book on pages* (128 & 129).

2

(A) 1. molecules 2. oxygen

3. The coulomb 4. sievert

(B) 1. b 2. b 3. c 4. b

(C) - The reading of the ammeter = zero because no electric current will pass.

- The reading of the voltmeter remains constant because it measures e.m.f. when the electric circuit is opened.

3

(A) 1. Electric potential of a conductor

2. Physical effects 3. Endocrine glands

4. Dwarfism

(B) **First :**

1. H_2O , (Neutralization reaction)

2. CO_2 , (Thermal decomposition reaction)

Second : 1. (1) Rr , (3) rr

2. 50%

(C) 1. $2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$

2. (1) 2Hg , (2) O_2

4

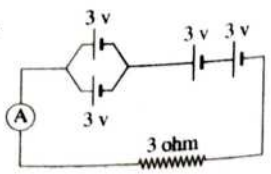
(A) 1. hydroxide 2. oxidizing agent

3. chemical 4. neutrons

(B) 1. c 2. e 3. b 4. d

(C) 1. $V = R \times I = 3 \times 3 = 9$ volt

2.



25 South Sinai Governorate

1

(A) 1. b 2. d 3. c 4. c

(B) 1. (✗) 2. (✗) 3. (✓) 4. (✓)

(C) No, because the electric current will flow from higher electric potential (B) to the lower one (A).

2

(A) 1. The electric resistance

2. Radioactivity phenomenon

3. Speed of chemical reaction

4. The chemical activity series

(B) 1. The rate of decomposition of hydrogen peroxide increases.

2. Cross pollination occurs in these flowers.

3. A white ppt. of silver chloride is formed.

$$NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$$

4. They produce 50% pea plants with smooth seed (Rr), and 50% pea plants with wrinkled seed (rr).

(C) $I = \frac{q}{t} = \frac{5400}{(5 \times 60 \times 60)} = 0.3$ ampere

3

(A) 1. Second 2. Salivary gland

3. Calcitonin 4. Sodium

(B) 1. c 2. d 3. b 4. a

(C) Oxidizing agent : CuO, and reducing agent : H_2

4

(A) 1. oxygen 2. Sievert

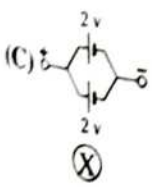
3. 100% 4. Bone marrow

(B) 1. alternating 2. DNA

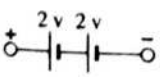
3. Control the electric current intensity

4. Zero %

(C)



(X)



(Y)

26 New Valley Governorate

1

(A) 1. Insuline 2. red

3. enzyme 4. genetic

(B) *Look at the main book on pages* (128 & 129).

(C) 1. No reaction occurs

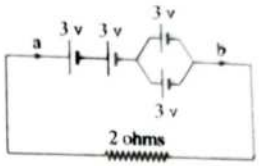
2. $2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + heat$

2

(A) 1. d 2. a 3. b 4. c

(B) ∵ $V = R \times I = 2 \times 4.5 = 9$ volt

∴ e.m.f. = 9 volt



(C) Because the reaction takes place between ions.

3

(A) 1. Gametes 2. Neutralization reaction

3. Hormones 4. Ampere

(B) 1. sodium nitrate ($2NaNO_3$) – white

2. Sodium nitrite ($2NaNO_2$) – Yellowish white

(C) The current intensity decreases.

4

(A) 1. neutrons 2. ohmmeter

3. Progesterone 4. CuO

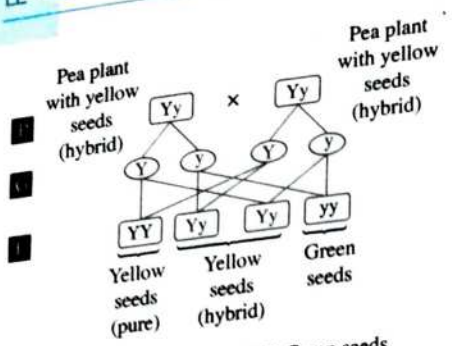
(B) 1. Ohm's law : The electric current intensity passing through a conductor is directly proportional to the potential difference a cross it at a constant temperature.

2. a. $I = \frac{q}{t} = \frac{100}{20} = 5$ ampere

b. $V = \frac{W}{q} = \frac{1000}{100} = 10$ volt

c. $R = \frac{V}{I} = \frac{10}{5} = 2$ ohm

(C)



75% Yellow seeds : 25% Green seeds

27 Matrouh Governorate

1

(A) 1. beginning – stopping

2. e.m.f. – electric potential difference

3. Nervous system – hormones

4. self pollinate – cross pollinate

(B) $H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$

Oxidizing agent "CuO", reducing agent "H_2"

(C) $I = \frac{V}{R} = \frac{2}{4} = \frac{1}{2}$ ampere

2

(A) 1. b 2. d 3. a 4. b

(B) 1. b 2. a 3. d 4. c

(C) 1. Because there is no potential difference between them (potential difference = zero).

2. Because it is regulate the activities of most other endocrine glands.

3

(A) 1. Endocrine glands.

2. The electric potential of conductor.

3. The speed of chemical reaction.

4. The volt.

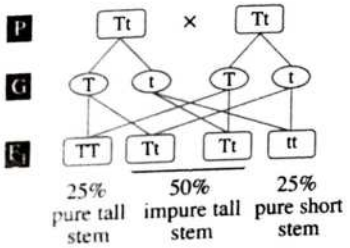
(B) 1. Thyroxin hormone : plays a main role in food assimilation process
Calcitonin : controls the level of calcium in blood.

2. Wide eyes : dominate trait
Narrow eyes : recessive trait.

3. Covalent compound : fast reactions
Ionic compound : slow reactions

4. Direct current : electrochemical cells
Alternating current : electric generators.

(C)



4

(A) 1. directly 2. carbon dioxide

3. 25% 4. more than

(B) 1. The concentration of resulting.

2. Joule / coulomb 3. Copper

4. Helium

(C) 1. $NaOH + HCl \xrightarrow{\Delta} NaCl + H_2O$

2. $Na_2CO_3 + 2HCl \xrightarrow{\Delta} 2NaCl + H_2O + CO_2\uparrow$

Final Examinations of Governorates 2021

1 Cairo Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. Neutralization is the reaction between an acid and an alkali to form ..... and water.
2. Wide eyes is from the ..... traits in the human being.
3. ..... gland secretes hormone that regulates the growth of the human body.
4. $Fe + 2HCl \xrightarrow{dil.}$ ..... + ...
5. Mendel's 1st law is called the law of .....

B What is meant by ... ?

1. The electric potential of a conductor.
2. Chemical activity series.

C Calculate the electric current intensity that flows through a cross-section of a wire if a charge of 2400 coulombs passes through it in 4 minutes.

Question 2

A Choose the correct answer :

1. The hormone responsible for the appearance of secondary sexual male characters is the .....

   a. progesterone. b. testosterone. c. estrogen. d. glucagon.

2. At the beginning of the chemical reaction the percentage of the reactants concentration equals .....

   a. 50% b. zero % c. 100% d. 25%

3. ..... is used to control the value of resistance in the electric circuit.

   a. Ammeter b. Voltmeter c. Ohmmeter d. Rheostat

4. Oxygen gas evolved by the thermal decomposition of .....

   a. $NaNO_3$ b. $Cu(OH)_2$ c. $CuSO_4$ d. $CuCO_3$

5. The electric current intensity resulting when a charge of one coulomb passes through a given cross-section in one second is called .....

   a. volt. b. ampere. c. coulomb. d. ohm.

B Give reasons for :

1. The speed of chemical reaction increases by increasing the temperature.
2. It is better to use the alternative current rather than the direct current.

C Explain on genetic principles the genetic structure of produced generation, if crossing takes place between two pea plants one of them with pure yellow seeds (YY) and the other with pure green seeds (yy). (If you know that the dominant is yellow)

Question 3

A Write the scientific term of each of the following statements :

1. Substances which speed up the chemical reaction without changing or being used up.
2. It is chemically consisted of nucleic acid called DNA bind with the protein.
3. It is the measuring unit of the absorbed radiation by the human body.
4. Special organs that secrete their hormones directly in the blood stream in human body.
5. A chemical process in which oxygen decreases in a substances.
6. It is the trait that appears in all individuals of the first generation in Mendel's experiment.

B What happens when ... ?

1. Adding silver nitrate solution to sodium chloride solution.
2. Decreasing the glucose level in blood.

C A battery consists of three electric cells, the e.m.f. for each is (1.5 Volt.) Calculate the total e.m.f. if they connect in :

1. Series connection.
2. Parallel connection.

Question 4

A Rewrite the following statements after correcting the underlined words :

1. **Ammeter** is a device used to measure the electromotive force.
2. The increase in secretion of **calcitonin** hormone leads to exophthalmic goiter disease.
3. The radioactive elements' nuclei contain a number of **protons** more than the number required for stability.
4. **Hereditary traits** that aren't transmitted from one generation to another.
5. **Pure individual** carries one dominant gene and other is recessive.
6. **Reducing agent** is the substance which gains an electron or more during a chemical reaction.

B Illustrate by balanced chemical equation :

1. Adding magnesium to copper sulphur solution.
2. The reaction of sodium with water.

C Compare between :

The electric cell & dynamo.

(regarding the change of energy in each)

2 Giza Governorate

Answer the following questions :

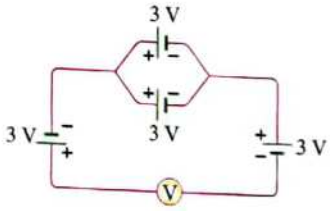
Question 1

A Put the suitable word in the missing parts in the following sentences :

(9 – DNA – recessive – Joule – 12)

1. The work done is measured by .....
2. The blue coloured and narrow eyes in the human are ..... hereditary traits.
3. The chromosome, chemically consists of a nucleic acid called ..... , which combined with protein.
4. **In the opposite figure :**

   The reading of voltmeter = ... volt.



B Put (✓) or (✗) in the front of the following statements :

1. Pancreas is a double function gland. ( )
2. The reaction : $Cl_2 + 2e^- \longrightarrow 2Cl^-$, represents oxidation process. ( )
3. Calcitonin hormone is control the level of calcium in the blood. ( )
4. The reactions of the covalent compounds are slow. ( )

C What is meant by ... ?

The electromotive force of an electric cell = 1.5 volt.

Question 2

A Write the scientific term of each of the following statements :

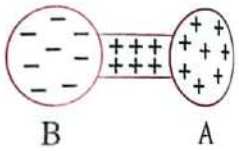
1. The catalyst which is used to decrease the rate of the chemical reactions.
2. It is the spontaneous decay of the atoms' nuclei of some radioactive elements that are present in nature, in an attempt to achieve a more stable composition.
3. The method which is used in a connection of the electric cells to obtain a high electromotive force (e.m.f).
4. A chemical process which causes the decrease in the oxygen percentage or the increase in the hydrogen percentage in a substance.

B Choose the correct answer :

1. On crossing male and female, their genotype (Bb), so the genotype (BB) is produced in their offspring at percentage of .....
   a. 25% b. 50% c. 75% d. 100%
2. Copper carbonate is decomposed by heating into copper oxide and ..... gas evolves.
   a. carbon dioxide b. sulphur dioxide c. sulphur trioxide d. hydrogen
3. According to chemical activity series (C.A.S) the aluminium element is more active than ..... element.
   a. sodium b. potassium c. zinc d. calcium
4. According to Mendel's first law, the hereditary factors are ..... when the gametes are formed.
   a. doubled b. combine c. segregate d. disappear

C In the opposite figure :

What happen when we connect the two conductors, (A) and (B) which are equal in the electric potential, according to the flow of the electric current.



Question 3

A Correct the underlined words :

1. The secretion of **thyroxin** hormone is increased in fear, anger and emotion.
2. The measuring unit of absorbed nuclear radiation is **roentgen**.
3. It is responsible for secrete testosterone hormone is **pituitary gland**.
4. The current intensity due to the flow of 4500 coulomb through a cross-section of a conductor in 5 minutes equals **20** ampere.

B Complete the following sentences by the suitable words :

1. According to the law of independent assortment of hereditary factors of Mendel, the dominant trait appears in the second generation at a percentage of .....
2. $NaCl + AgNO_3 \longrightarrow$ .....↓ $+ NaNO_3$
3. Mendel removed the ..... of pea plant's flower to avoid a self pollination.
4. The speed of reactions of cooking food increases by .....

C What happen when ... ?

Placing a piece of magnesium ribbon in a solution of blue copper sulphate ?
Write the balanced chemical equation which represent this reaction.

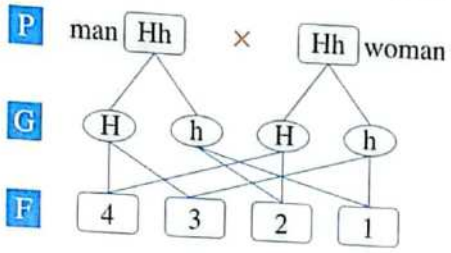
Question 4

A Choose from column (B), what suit it in column (A) :

(A)	(B)
1. Neutralization reaction	a. it is a process which converts a substance to another substance.
2. Electric dry cells	b. it is an electric current with variable intensity and direction.
3. Chemical reaction	c. it is a reaction between an acid and a base to form salt and water.
4. The alternating electric current	d. transfer the chemical energy into electric energy.

B According to your studding answer the following :

1. The opposite figure represents the inheritance of one of humans traits, what is the number of the child that carries the recessive trait ?



2. The potential difference between the two ends (terminals) of electric apparatus, which its resistance equals 22 ohm, and electric current intensity passes through it equals 10 ampere = ... volt.
3. The ..... apparatus is used to measure the electric resistance in the electrical circuits.
4. On crossing pea plant of smooth hybrid seeds with another which wrinkled seeds it produces .....

C Give a reason for :

Forming of silvery colour on heating red mercuric oxide, write the balanced equation of the reaction.

3 Alexandria Governorate

Answer the following questions :

Question 1

A Complete the following statements :

1. The spontaneous decaying of the atoms' ..... of some radioactive elements to be more stable elements is known as .....
2. The speed of chemical reaction is considered as the change in the ..... of the reactants and resultants at a unit of time.
3. The Mendelian hereditary trait in the living organism is controlled by one pair of .....

B What are the results in the following cases ... ?

1. Adding dilute hydrochloric acid to sodium carbonate. (Illustrate by the symbolic equation only)

2. The human body cells are unable to use glucose.

C Choose from column (B), what suits statements in column (A) :

(A)	(B)
1. The sliding rheostat.	a. the flow of electric negative charges in a conducting substance.
2. Oxidase enzyme.	b. control the resistance that the electric current faces on passing through wire.
3. The chemical reaction.	c. the quantity of electric charges that flows through a cross-section of the conductor in one second.
4. The current intensity.	d. increasing the decomposition of hydrogen peroxide solution.
	e. the breaking up of bonds in the reactants molecules and the formation of new bonds in the products molecules.

Question 2

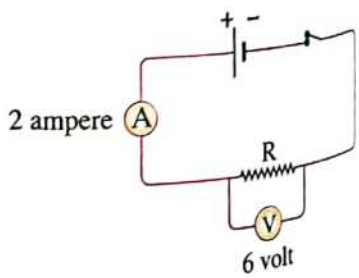
A Write the scientific term of each of the following statements :

1. The arrangement of the metallic elements in a descending order according to the degree of their chemical activity.
2. The hormone that is responsible for growing of the endometrium.
3. The value of the work done to transfer a quantity of electric charges of one coulomb between the two poles of a conductor.
4. Compounds their reactions are slow and occur between the molecules.

B In the human, the trait of free ear lobe (E) dominates the trait of attached ear lobe (e) trait. What will be the result of marriage of a man and a woman both are hybrid. Show this case on genetic bases.

C Look at the opposite figure, then calculate :

1. The value of resistance (R).
2. The quantity of electricity passing through the circuit at a half minute.



Question 3

A Choose the correct answer :

1. The ..... generates direct current.
   a. dry cell b. ohmmeter c. voltmeter d. ammeter
2. Mendel chose the pea plant to conduct his experiments for all the following reasons except .....
   a. the plant can be artificially pollinated. b. the short life cycle of the plant.
   c. the big size of the plant. d. the flowers are hermaphrodite.
3. From the properties of the alternating current is .....
   a. constant intensity. b. constant direction.
   c. can not be transferred. d. variable intensity and direction.
4. The chromosome is chemically consisted of nucleic acid (DNA) combined with the .....
   a. vitamins. b. protein. c. fats. d. carbohydrates.

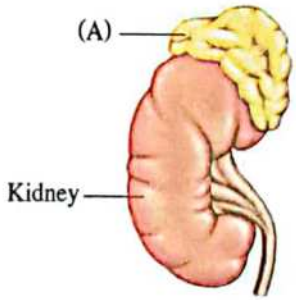
B Study both equations and answer the following :

$NaCl + AgNO_3 \longrightarrow (X) +$ white precipitate

$(X) \xrightarrow{\Delta}$ salt + (Y)

1. Write the chemical formula for (X) and (Y).
2. Mention the type of reaction in each equation.

C Look at the opposite figure and answer :



1. What is the name of (A) gland ?
2. Mention the function of the hormone which the (A) gland secretes.

Question 4

A Correct the underlined words :

1. The dynamo is used to convert the **chemical** energy into electric energy.
2. Most metal carbonates are decomposed by heat into **metal** and carbon dioxide.
3. The hereditary traits are found inside **cytoplasm** of the cell of the living organism.
4. Cosmic radiation is considered as **artificial** source of radiation pollution.

B Give reasons for each of the following :

1. The fridge is used to preserve food.
2. Some electric cells are connected in parallel in electric circuit.

C What is meant by ...?

1. Reducing agent. 2. Acquired traits.

4 Qalyoubia Governorate

Answer the following questions :

Question 1

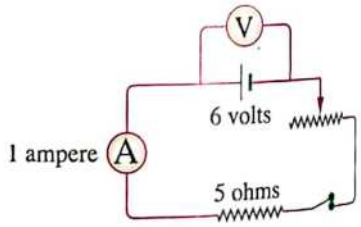
A Choose the correct answer :

1. The measuring unit of electromotive force is .....
   a. ampere. b. ohm. c. coulomb. d. volt.
2. The individual that carries a different pair of genes for a specific trait is .....
   a. pure. b. recessive. c. hybrid. d. dominant.
3. The resistance of the conductor which carries a current of 3 ampere when the potential difference between its two ends is 12 volt equals ..... ohm.
   a. 4 b. 6 c. 9 d. 12
4. From the dominant hereditary traits in the human being is .....
   a. presence of dimples. b. smooth hair.
   c. narrow eyes. d. presence of freckles.

B Correct the underlined word(s) from the following :

1. Oxidation is a chemical process where the atom loses **proton** or more during the chemical reactions.
2. Adrenal gland secretes **insulin** hormone.
3. The reaction between silver nitrate with sodium chloride is from **very slow** reactions.
4. The simple goiter is produced due to the decrease in the secretion of **growth** hormone.

C In the opposite electric circuit, calculate the reading of voltmeter when the switch is open.



Question 2

A Choose the correct answer from brackets, and put it in the suitable place in the following statements :

(coulomb – artificial – mercuric oxide – oxygen – natural – copper carbonate – ohm – hydrogen)

1. Cosmic rays are considered from the sources of ..... radiation pollution.
2. From examples of compounds which decompose by heat into metal and oxygen is .....
3. The quantity of electricity is measured by a unit called .....
4. Some metal nitrates decomposes into metal nitrite and ..... gas evolves.

B Put sign (✓) or (✗) in the front of the following statement :

1. Neutralization is a reaction between salt and water to form an acid and an alkali. ( )
2. Mendel covered the stigmas of flowers to prevent the mixed pollination. ( )
3. By increasing the surface area of the reactants exposed to reaction, the chemical reaction stops. ( )
4. When a hybrid red flower pea plant is pollinated with white flower pea plant, all the produced plants are red flowers. ( )

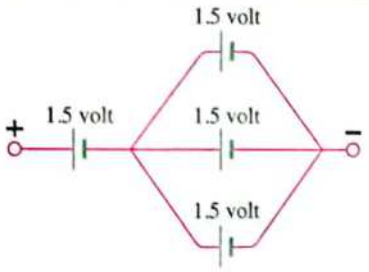
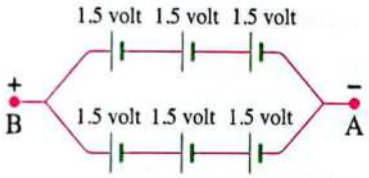
C What happens when ... ?

The flow of negative electric charges (electrons) in a metal wire and in only one direction.

Question 3

A Complete the following tables :

The hormone name	The secreted gland	The function
Growth hormone	.....(1).....	regulates the general growth of the body
Glucagon	.....(2).....	.....(3).....
.....(4).....	Ovary	promotes the growth of endometrium

The way of connection of cells		
e.m.f for the battery	.....(1).....	.....(2).....

B Choose from column (B), what suits it in column (A) then write the complete statement :

(A)	(B)
1. A substance which changes the rate of the chemical reaction without changing is called	a. acquired
2. The law of segregation of factors is the ..... law of Mendel	b. O_2
3. On heating copper carbonate ..... gas evolves	c. second enzymes
4. Learning of walking in children is from the ..... traits.	d. hereditary
	e. catalyst
	f. first
	g. CO_2

C **What happens when ... ?**

with explaining by a balanced symbolic equation :

Putting a piece of magnesium sheet in a test tube containing blue copper sulphate soluti

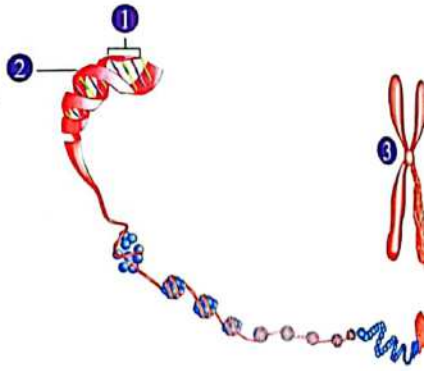
Question 4

A **Write what the following statements indicate to :**

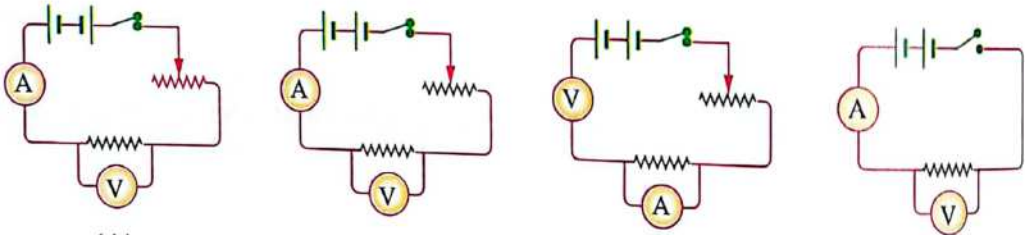
1. The change in the concentration of the reactants and the resultants in a unit time.
2. The elements whose atoms' nuclei contain a number of neutrons more than the numb required for its stability.
3. The arrangement of metals in a descending order according to the degree of their chemi activity.
4. The quantity of electric charges in coulomb flowing through a cross-section of the conductor in one second.

B **1. Study the figure in front of you, then complete the following spaces :**

The point number (3) represents ..... which its chemically structure from number (2) which is ..... and connected with protein, and it carries ..... to the individual, while number (1) that represents ..... which transmits the hereditary traits from parents to offspring.

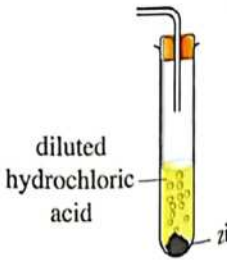


2. Choose the right electric circuit which is used to verify Ohm's law practically. Then write the mathematical relation of Ohm's law.



(A) (B) (C) (D)

C From the opposite figure conclude the produced gas, then write the balanced chemical equation which represents that reaction.



5 El-Menofia Governorate

Answer the following questions :

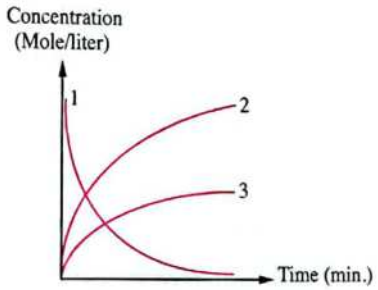
Question 1

A Write the scientific term of each of the following :

1. It is the state of a conductor that shows the transfer of electricity from or to it when it is connect to another conductor.
2. Parts of (DNA) present on the chromosome and they are responsible for appearing the individual (hereditary) traits.
3. The quantity of charge which transferred by a constant intensity of one ampere across the conductor in one second.
4. An individual carries two genetic factors for the character, one of them is dominant and the other is recessive.

B First :

The opposite graph represents concentration of both reactants and products during thermal decomposition of sodium nitrate with the time.



By using the graph complete the following :

1. The curve No. (1) refers to ..... compound that has ..... color.
2. The curve No. (2) refers to ..... compound that has ..... color.

Second :

A gland existed in the digestive system of human that has a role in digestion process also it is secretes two hormones with opposite effect due to their functions.

Based on the previous determine each of the following :

1. The name of this gland is .....
2. The name of the first hormone is .....
3. The name of the second hormone is .....

C The potential difference among the terminals of a conductor is 20 volts. a work of 200 joules was done to transfer a charge between its terminals within 2 seconds. Calculate the electric current intensity passing through this conductor ?

Question 2

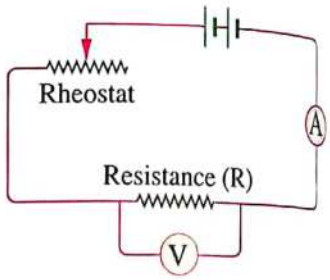
A Choose from column (B), what suits it in column (A) :

(A)	(B)
1. The electric generator (dynamo)	a. should be stable.
2. Covalent compounds	b. they are fast in their reactions.
3. The region chosen to store radioactive wastes	c. produce direct current.
4. Ionic compounds	d. they are slow in their reactions.
	e. produce alternating current.
	f. should be unstable.

B Complete the following by using suitable words :

1. Mendel's second law is called the law of .....
2. The time of combustion (burning) of the steel scourers used for cleaning aluminium burning in pure oxygen in a jar is ..... the time of its burning in the atmospheric air.
3. The time of dissolving an effervescence tablet in an amount of cold water is ..... the time of dissolving a similar one in the same amount of hot water.
4. The traits that are not transmitted from one generation to another are called .....

C In the opposite circuit when the slider of rheostat moves causing increasing of ammeter reading this means :



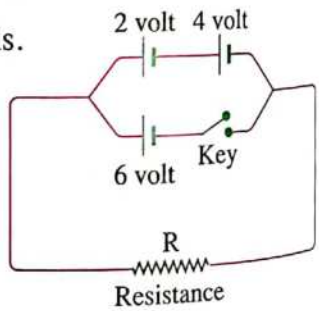
1. The value of rheostat resistance .....
2. The voltmeter reading .....
3. The value of resistance (R) .....

Note : Use (increases – decreases – does not change)

Question 3

A Correct the underlined words :

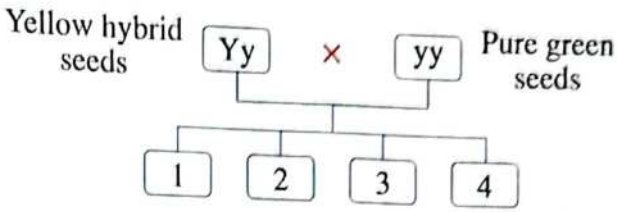
1. The removal of the **thyroid gland** leads to the adrenalin is not secreted that stimulates the body during emergency cases.
2. The **kinetic** energy converts to electric energy in electric cells.
3. **Diabetes** is occurred due to decrease of secretion in the growth hormone at the childhood.
4. In the figure when the key is closed the current intensity that passes through the resistance (R) **increases**.



B First : complete the following table :

The reaction	The type of the reaction or the process
$A \longrightarrow A^+ + e^-$	.....(a).....
$BC\ (solution) + A \longrightarrow AC + B$	.....(b).....

Second : in the given figure replace the number with suitable letters to give the produced generation in your answer sheet ?



C Explain the following :

1. On putting a piece of sweet potato in a glass beaker contains hydrogen peroxide the rate of decomposition of it increases.
2. The slow start of the reaction between aluminium and hydrochloric acid practically.

Question 4

A Put (✓) or (✗) in the front of the following statements :

1. The reaction between hydrochloric acid and sodium carbonate is a neutralization reaction. ( )
2. Mercury causes the corrosion of the gold when they touch each other because it is more active than gold. ( )
3. The alternating current can be converted to direct current. ( )
4. The rheostat is used to measure the electric resistance. ( )

B Choose the correct answer :

1. Which of the following is a dominant trait in human .....
   a. presence of freckles. b. narrow eyes.
   c. straight hair. d. free ear lobe.
2. Electromotive force and potential difference have the same measuring unit which is .....
   a. ohm/ampere b. ampere/ohm
   c. coulomb/joule d. joule/ampere.second
3. The two scientists who made the (DNA) model are .....
   a. Badel and Tatum. b. Badel and Mendel.
   c. Crick and Watson. d. Mendel and Tatum.

4. ..... is one of the genetic effects produced due to exposing the human to small dose of radiation for a long period of time.
   a. Damage of the central nervous system
   b. Damage of the spleen
   c. Change the structure of sex chromosomes
   d. Change the structure of the hemoglobin

C 1. A (Green compound) $\xrightarrow{\Delta}$ B + $CO_2\uparrow$

2. B + H_2 $\xrightarrow{\Delta}$ X + H_2O

By using the two equations answer the following :

1. Write the chemical formula for A , B , and X (respectively).
2. Name the process that happened to the substance (B) during the reaction number (2) that leads to change it to the substance (X) ?

6 Dakahlia Governorate

Answer the following questions :

Question 1

A Choose the correct answer :

1. On heating copper sulphate, a ..... color precipitate is formed.
   a. yellow b. blue c. red d. black
2. Genes control the organism's genetic characteristics by producing .....
   a. hormones. b. enzymes. c. chemical compounds. d. vitamins.
3. The measuring unit of the quantity of electricity flowing through a cross-section of the conductor in one second is .....
   a. coulomb. b. ampere. c. volt. d. ohm.
4. The ..... hormone stimulates glucose storage in the liver.
   a. calcitonin b. thyroxin c. epinephrine d. insulin

B Write the symbolic balanced equation only for the following :

1. Adding silver nitrate solution to sodium chloride solution.
2. Passing the hydrogen gas through hot copper oxide.
3. Putting a small piece of sodium in water.
4. The reaction between hydrochloric acid with sodium carbonate.

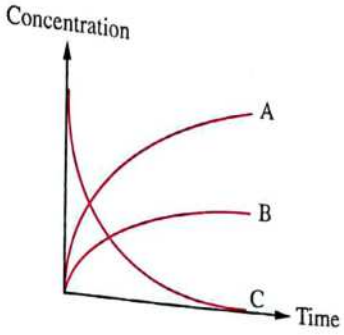
C If you know that the curly hair trait (G) is dominant on the smooth hair trait (g), a man married a woman and they had four children, if you know that half of them got the curly hair and the other half got smooth hair. Illustrate on hereditary bases.

Question 2

A Complete the following statements :

1. The first human tissue which is affected by exposure to radiation is .....
2. The substance which decreases the energy needed for the chemical reaction is called .....
3. The dominant trait which appears on the tongue is .....
4. The glucagon hormone affects on ..... when the level of blood sugar decreases.

B From the following equation $CuSO_4 \xrightarrow{\Delta} CuO + SO_3\uparrow$ and from this shown diagram define which curve represents the concentration of :



1. Copper oxide.
2. Copper sulphate.
3. Sulphur trioxide.
4. What is the type of the shown reaction ?

C Define each of the following :

1. Ohm's law.
2. The speed of chemical reaction.

Question 3

A Correct the underlined words in the following statements :

1. The speed of chemical reaction increases by increasing the concentration due to the **Decreasing the surface area** between the molecules.
2. Hormones transfer from their sites of secretion to reach their sites of action by the **skin**.
3. Sodium is monovalent, because it **gains one electron** to form a positive ion.
4. We can control of the electric current intensity and the potential difference in a circuit by using **the voltmeter**.

B Write the scientific term of each of the following :

1. The reaction of an acid and an alkali to give salt and water.
2. The spontaneous conversion (naturally) of the nuclei of the atoms of some radiating elements to achieve a more stable composition.
3. The condition of the electrical conductor that indicates the transfer of electricity from it or to it if it is connected to another conductor.
4. Vital structure consists of a nucleic acid and protein carries the genetic information of the living organisms.

C **Compare between :**

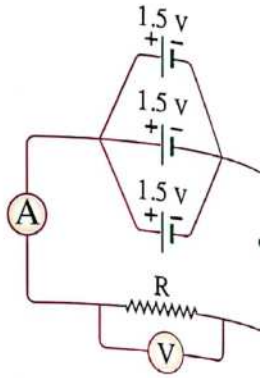
The alternating current and the direct current (according to their source of generation).

Question 4

A **Give reasons for each of the following :**

1. The reactions between ionic compounds are fast.
2. Is often better to use alternating current rather than the direct current.
3. Mendel cultivated pea plants that produce yellow seeds for several generations.
4. The stopping of the body growth may occurs sudden, and the person becomes a dwarf.

B **If a quantity of electricity which passes through the opposite electric circuit in a time 20 seconds is 10 coulombs :**



1. Choose which action is needed to be done so both ammeter and voltmeter show their reading
   (close the key – change resistance – change battery position)
2. Calculate the ammeter reading.
3. Calculate the voltmeter reading.
4. What is the resistance of the wire (R).

C **Write the chemical formula for each of the following :**

1. pentoxide nitrogen gas.
2. hydrogen chloride gas.

7 Sharkia Governorate

Answer the following questions :

Question 1

A **Write the scientific term of each of the following :**

1. The electric state of a conductor that shows the transference of electricity from or to it, when it is connected to another conductor.
2. It is chemically consists of a nucleic acid called DNA combined with protein.
3. The ratio between the work done and the quantity of electric charge which passing between two points.
4. It is the individual that carries a different pair of genes.

D Rewrite the following statements after correcting the underlined words :

1. $Fe + 2HCl \xrightarrow{dil.} \underline{FeCl_3} + H_2\uparrow$
2. Thyroxid gland secretes calcitonin hormone that **regulates the growth of reproductive organs in human**.
3. $2Na + 2H_2O \longrightarrow 2\,NaOH + \underline{O_2} + Heat$
4. **Adrenalin** hormone promotes the growth of endometrium.

C Calculate the potential difference between two terminals of conductor with electric current intensity 5 ampere in time 10 seconds. If the work was 200 joule.

Question 2

A Choose the correct answer between the brackets :

1. Oxygen gas evolves from ..... compound by thermal decomposition.
   a. $Cu(OH)_2$ b. $CuSO_4$ c. $CuCO_3$ d. HgO
2. The flow of electric charges through a metal wire represents .....
   a. resistance. b. electric current intensity.
   c. electric current. d. potential difference.
3. Iron filings react with diluted hydrochloric acid faster than a piece of iron and the factor affecting the interaction is .....
   a. the nature of reactants. b. the concentration of the reactants.
   c. the temperature of the reaction. d. catalyst.
4. If the quantity of charge which passes in an electric wire is doubled and the time of its passing decreases to its half, the current intensity will .....
   a. increase four times. b. decrease to quarter.
   c. remains constant. d. doubled.

B Put (✓) or (✗) in the front of the following statement :

1. Neutralization it is a reaction between an acid and an alkali to form salt and water. ( )
2. Mendel chose ten traits in pea plant to conduct his experiments. ( )
3. Fireworks reaction is fast but rusting of iron needs million of years. ( )
4. When a male of genetic structure (Bb) and female with genetic structure (bb) are crossed, the predicted percentage for appearance of genetic structure (BB) in there offspring is 25%. ( )

C Show by drawing only the connection of the voltmeter in the electrical circuit to measure :
The potential difference between the two ends of a lamp - the electromotive force between the poles of battery.

PART 3

Question 3

A Complete the following statements :

1. The current produced from electro chemical cells is the ..... current.
2. When the amount of iodine decreases in food the secretion of the ..... hormone decreases.
3. The radiologist should not be exposed to radiation amount more than ..... millisievert per year.
4. The pituitary gland secretes ..... hormone that controls the speed of growth rate of the muscles.

B Choose the correct answer :

1. On adding copper turning to diluted hydrochloric acid ..... is produced.
   a. copper hydroxide b. copper carbonate
   c. copper chloride d. no reaction
2. The two factors of hereditary are similar in the ..... individual.
   a. pure b. hybrid c. recessive d. pure and recessive
3. The oxidizing agent is a substance which .....
   a. gives oxygen. b. removes oxygen.
   c. gives and removes oxygen. d. no correct answer.
4. According to Mendel's second law, each pair of the alternative traits is inherited independently of the others and appears in the second generation at a ratio of .....
   a. 1 : 1 b. 2 : 1 c. 3 : 1 d. 4 : 1

C How can you obtain copper from copper sulphate solution by two methods with writing balanced equation ?

Question 4

A Correct the underlined words :

1. The ionic compounds are fast in their reaction because they decompose into **molecules** that easy share in the reaction.
2. The value of the resistance of a conductor changes according to change in the **potential difference across its terminals**.
3. Nitrogen pentoxide decomposes into nitrogen dioxide and **nitrogen** gas.
4. The measuring unit of **resistance** is volt.ampere.second.

B Complete the following sentences :

1. The ..... apparatus is used to measure electric resistance.
2. Mendel covered the ..... of pea plant to prevent cross pollination.
3. The electric current intensity passing in an electric device its resistance 5 ohm when the potential difference between its terminals 200 volt ..... ampere.
4. Genes control the appearance of hereditary traits of the living organism by producing .....

C A student used 3 grams of manganese dioxide during decomposition of hydrogen peroxide.
Explain :
The reason of using manganese dioxide – the mass of manganese dioxide at the end of the reaction.

8 El-Gharbia Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. The ability to roll the tongue is one of the ..... traits in the human being.
2. The ..... apparatus is used to measure the electromotive force.
3. Every hereditary trait is controlled by two hereditary factors which separate during formation of the .....
4. The ..... effects of radiation is a result of changing in the sex chromosomes composition of the cell.

B Write the scientific term for the following statements :

1. The change in the concentration of the reactants and products at a unit time.
2. The hormone that is responsible for the appearance of the male secondary sex characteristics.
3. The arrangement of metals in a descending order according to their chemical activity.
4. They are ductless glands that secrete their hormones directly in the blood.

C Calculate the quantity of electricity that passes through a conductor of a resistance 2200 ohm for two minutes. If the potential difference between its terminals is 220 volt.

Question 2

A Choose the correct answer :

1. When magnesium substitutes copper in copper salt solutions, the colour of the precipitate is .....

a. black. b. red. c. blue. d. green.

PART 3

2. In the electric cell, ... energy is converted into electric energy.
   a. magnetic b. kinetic c. chemical d. light
3. At the end of the chemical reaction, the concentration of the reactants is .....
   a. Zero% b. 50% c. 75% d. 100%
4. The nuclear energy is peacefully used in the industrial field to convert sand to ..... for manufacturing computer processors.
   a. electric energy b. silicon sheets c. nuclear fuel d. atomic bombs

B Put (✓) or (✗) in the front of the following statements :

1. In positive catalytic reactions, catalyst is used to slow down the speed of the chemical reaction. ( )
2. The individual which gains one gene for freckles in the face becomes without this feature. ( )
3. The chemical reaction is a process of breaking up of bonds between molecules of reactants and formation of new bonds in products molecules. ( )
4. The two factors of a hereditary trait are similar in the hybrid individual. ( )

C A battery consists of three similar cells, the electromotive force of each cell is 2 volt. **Calculate** the total electromotive force of the cells, when they are connected in :
1. series. 2. parallel. (Write the used law in each case)

Question 3

A Correct the underlined words :

1. Pituitary gland exists below the **pancreas**.
2. Ammeter is connected in the electric circuit in **parallel**.
3. The **estrogen** hormone is secreted on increasing percentage of glucose sugar in the blood.
4. In the circuit of the direct current, **molecules** flow from one of the two poles to the other in the electrochemical cell.

B What is the importance of each of the following ?

1. The genes.
2. Oxidase enzyme in sweet potato.
3. The human genome.
4. The catalytic converter in modern cars.

C Compare between :

"Oxidizing agent and Reducing agent" (according to : the electronic concept).

Question 4

A Choose from column (B), what suits it in column (A) :

(A)	(B)
1. Heating copper sulphate.	a. $\frac{\text{volt}}{\text{ampere}}$
2. Ampere.	b. $\frac{\text{Joule}}{\text{coulomb}}$
3. Ohm.	c. $\frac{\text{coulomb}}{\text{second}}$
4. The reaction of zinc with dil. hydrochloric acid.	d. thermal decomposition
	e. double substitution.
	f. simple substitution.

B What are the results of each of the following ?

1. Touching two charged conductors by a conducting bar, the first conductor has an electric potential is equal to the electric potential of the second one.
2. The stigma of the flower of pea plant uncovered during the study of the inherited traits.
3. Vanishing or decreasing the attraction force in the atom between the nucleus and the electrons in the outer level.
4. A gene failed to produce its own enzyme.

C If you have the following substances :

(hydrochloric acid – silver nitrate – sodium carbonate – sodium chloride)

Show by balanced symbolic equations only how to get :

1. A white precipitate
2. A gas turbids limewater.

9 Damietta Governorate

Answer the following questions :

Question 1

A Write the scientific term for each of the following :

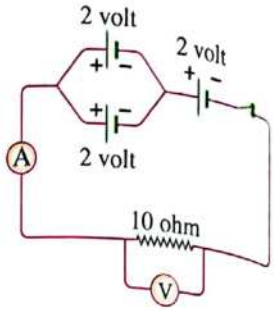
1. The quantity of charges transferred by a constant current intensity of one ampere in time of one second.
2. The cells in which the chemical energy is converted into electric energy.
3. The trait that appears in all individuals of the first generation in Mendel's experiment.
4. Parts of DNA that are present on the chromosomes and control the hereditary traits of the individual.

B Complete the following sentences :

1. The double substitution reactions between salt solutions are accompanied by the formation of .....
2. When the amount of iodine decreases in the food, the secretion of the ..... hormone decreases.
3. Some reactions are very slow and need several months to take place such as .....
4. The pancreas secretes ..... hormone to raise the level of glucose sugar in blood.

C From the opposite figure calculate :

1. The electromotive force of the battery.
2. The electric current intensity passing through the circuit.



Question 2

A Choose the correct answer :

1. The reaction of an acid with an alkali to give salt and water is known as ..... reaction.
   a. reduction b. neutralization c. simple substitution d. oxidation
2. The flow of electric charges through a metal wire in closed circuit represents .....
   a. the electric resistance. b. the electric current intensity.
   c. the electric current. d. the electric potential difference.
3. All of the following metals replace hydrogen of the dilute acid except .....
   a. Au b. Al c. Zn d. Sn
4. The changes in the sex chromosomes composition of parents from the ..... effects of radiation.
   a. physical b. genetic c. cellular d. physical and cellular

B Rewrite the following statements after correcting the underlined words :

1. Mendel's first law is called the law of **independent assortment of hereditary factors**.
2. When sodium atom loses an electron from its outermost energy level, it becomes **reduced and oxidizing agent**.
3. When an individual carries hybrid dominant trait (Bb) and female carries recessive trait (bb) copulate, the result of the crossing **75% dominant and 25% recessive**.
4. Most metal sulphate decompose by heating into metal oxide and **carbon dioxide** gas evolves.

C What happens when ...?

1. Two conductors having the same electric potential are connected together by a wire.
2. Exposing a man for a large dosage of atomic radiation for a short period of time.

Question 3

A Put (✓) or (✗) in the front of the following statements :

1. Gigantism is a continuous growth in limbs bones as a result of deficiency of growth hormone in childhood. ( )
2. The e.m.f of three similar cells connected in parallel is equal to the e.m.f. of one cell. ( )
3. Adrenalin hormone stimulates body's organs to respond to emergencies. ( )
4. The ohmmeter is used to measure the potential difference of an electric circuit. ( )

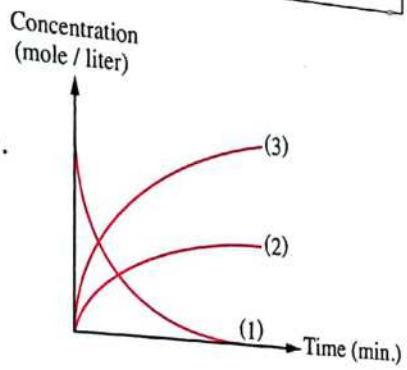
B Choose from column (B), what suits it in column (A) :

(A)	(B)
1. The recessive trait is always	a. hybrid only.
2. Curly hair from the	b. the electric generator.
3. Source of alternating current is	c. pure only.
4. The measuring unit of electric potential difference is	d. dominant traits.
	e. volt.
	f. recessive traits.

C The opposite graph represents :

The rate of thermal decomposition of sodium nitrate.

1. Write the balanced symbolic equation of this reaction.
2. Replace the numbers on the figure by suitable substances from the equation.



Question 4

A Choose the correct answer :

1. The genetic structure of wrinkled yellow colored seeds of a pea plant is .....
   a. YYSS b. yyss c. YYss d. yySS
2. At the beginning of the reaction, the percentage of the reactants concentration equals .....
   a. 100% b. 0% c. 50% d. 25%
3. The ..... is responsible for carrying oxygen to the body cells.
   a. bone marrow b. blood hemoglobin c. chromosomes d. genes
4. The air bag contains sodium ..... substance.
   a. azid b. sulphate c. oxide d. carbonate

B **1. What happens when ...?**

a. Mating between two pure individuals different in two pairs of contrasting traits (explain on genetic principles).

b. Heating of red mercuric oxide.

2. You have three similar electric cells, show by drawing how you can connect them to get the highest electromotive force. (e.m.f.) (Mention the type of connection)

C **Give reasons for :**

1. Not keeping silver nitrate solution in aluminium containers.
2. The fridge is used to preserve food.

10 Kafr El-Sheikh Governorate

Answer the following questions :

Question 1

A **Complete the following sentences :**

1. The color of copper carbonate changes from green to ..... when heated.
2. Scientists found that ..... are DNA parts present on the chromosomes.
3. ..... gland consists of two lobes and located in the front surface of the neck.
4. $Zn + 2HCl \xrightarrow{dil.} ZnCl_2 +$ .....

B **Give reasons for :**

1. Aluminium practically late in its reaction with hydrochloric acid.
2. Cooling food preserves it for long period of time.
3. Mendel selected pea plant to conduct his experiments.
4. Reaction between ionic compounds is fast.

C **Mention :**

What was the discovery of Henry Becquerel that made radioactivity to be known for the first time ?

Question 2

A **Choose the correct answer :**

1. On mating two parents one of them has a dominant pure trait while the other has a recessive trait the percentage of recessive traits in offspring of the first generation is .....

a. 75% b. 50% c. 25% d. Zero%

2. Sliding rheostat is used to ..... the resistance value in an electric circuit.
   a. change b. measure c. magnify d. diminish
3. Zinc element is more active than .....
   a. potassium. b. hydrogen. c. sodium. d. magnesium.
4. Nuclear reactions can't be controlled in .....
   a. nuclear reactors. b. medical labs. c. turbines. d. nuclear bombs.

B Give one example the followings :

1. A chemical compound that decomposes by heat.
2. A source of electric current.
3. A peaceful use of nuclear energy.
4. A dominant hereditary trait.

C Mention the name and function of what is called the master gland in the human body.

Question 3

A Write the scientific term for each of the following :

1. The international unit of measuring the radiation absorbed by the human body.
2. A substance that changes the rate of the chemical reaction without being changed.
3. An instrument used to measure current intensity.
4. Traits that are not transmitted from one generation to another.

B Mention one use or benefit of each of the following :

1. Alternating electric current.
2. Voltmeter.
3. Car air bag.
4. Adrenal glands.

C Write the chemical equation which illustrates the reaction between hydrochloric acid and sodium hydroxide.

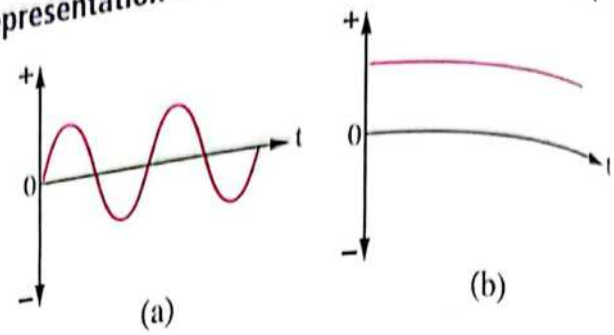
Question 4

A Correct the underlined words from the followings :

1. The testosterone hormone is responsible for appearance of **female** secondary sex characters.
2. Mercuric oxide has **silvery** color.
3. Rate of chemical reaction depends on concentration of the **products**.
4. Dynamo converts **light** energy into electric energy.

B **The figure shown to you is a graphic representation of the types of electric currents :**

1. Give name to the current in figure (a) and (b)
2. Mention which type of them can be transported to long distances.
3. Mention which type of them is produced from electrochemical cells.



C **Mention :**

What will be the result of the decrease in the secretion of the insulin hormone.

11 Behira Governorate

Answer the following questions :

Question 1

A **Choose the correct answer :**

1. Which material doesn't produce black product when it is heated .....
   a. $CuCO_3$ b. $CuSO_4$ c. $Cu(OH)_2$ d. HgO
2. All of the following elements can substitute the hydrogen of diluted acids except .....
   a. Al b. Zn c. Au d. Pb
3. All of the following units are used to measure the electric current intensity except .....
   a. ampere b. joule/coulomb c. coulomb/sec d. volt/ohm
4. ..... is secreted by pituitary gland to regulate the growth rate of muscles and bones.
   a. Growth b. Clacitonin c. Adrenalin d. Insulin

B **Determine the importance or uses of the following :**

1. Catalytic converter in modern cars.
2. Clothes and cloves are used by radiologist in hospitals.
3. Alternative current.
4. The genes.

C **Find out the electric current intensity in the wire when the work is done 20 joule to transfer quantity of electricity 40 coulomb cross section of wire its resistance 10 ohm.**

Question 2

A What is meant by the following ...?

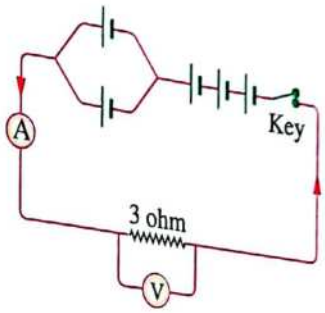
1. The chromosome.
2. Ampere.
3. Direct current.
4. Oxidation process. (electronic concept)

B What happens when ...?

1. Two charged conductors are touched and the electric potential of one of them larger than another.
2. Increasing glucose level in the blood above the normal level.
3. Put a small piece of sodium in water cup.
4. Mating two pure individuals are different in pair of their contrasting traits.

C In the following electric circuit in the figure :

If the potential difference between resistance ends equals the total (e.m.f.) of all cells, if the (e.m.f.) of each cell equals 1.5 volt and the resistance 3 ohms. Find the electric current intensity passes in Ammeter.



Question 3

A Write the scientific term for the following statements :

1. The genetic map of genes that is existed on the human chromosomes.
2. The opposition of electric current in a cross-section of a conductor.
3. Traits can't transfer from one generation to another.
4. Chemical substances which are produced by living organism's body to work as a catalyst to increase the speed of vital biological reactions.

B Correct the underlined words :

1. The reactions of ionic compounds are fast because they are decomposed into **molecules** easier to react.
2. Measuring unit of electric charge is **volt**.
3. From the recessive traits of pea plant is **swollen** pod.
4. At the end of the chemical reaction the ratio of reactants concentration is **100** %

C Compare between :

The positive catalytic reactions and negative catalytic reactions.

Question 4

A Complete the following sentences :

1. $2NaNO_3 \xrightarrow{\Delta}$ ..... + ...
2. Thyroid gland secretes ..... hormone which is responsible for regulating calcium level in the blood.
3. $Mg + CuSO_4 \longrightarrow$ ..... + ...
4. The speed of most of chemical reactions ....., by increasing of temperature.

B Give reasons for :

1. The ability of rolling tongue from the dominant traits of human.
2. The resistance of electric conductor increases by increasing its length.
3. The silver colour appears when the red mercuric oxide is heated.
4. Black substance is formed if the blue copper hydroxide is heated.

C Explain, on genetic bases, the product of the mating of a tomato plant with red fruits (R_r) and a green tomato plant (rr), showing the characteristics of the resulting generation and the ratio of the resulting individuals.

12 Ismailia Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. The ..... apparatus is used to measure the electric current intensity, while ..... is measured by using voltmeter.
2. Electric cells produce ..... current, while the dynamo produces ..... current.
3. Each hereditary trait is controlled by ..... which are separated during formation of the .....
4. The ability to roll the tongue is one of the ..... traits, while the attached ear lobe is from ..... traits.

B Choose from columns (B) and (C), what suit it in column (A) :

(1)

	(A) reaction	(B) evolving gas	(C) gas detection
a.	Sodium with water	1. SO_3	A. increases the glow of the burning match.
b.	Heating sodium nitrates	2. H_2	B. burning with a pop sound.
		3. O_2	C. turbid the clear limewater.

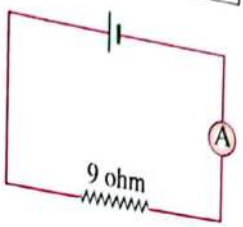
(2)

	(A) gland	(B) hormones	(C) function
a.	Pancreas	1. Adrenalin	A. It stimulates the growth of endometrium (the lining of uterus).
b.	Thyroid	2. Glucagon	B. it controls the level of calcium in blood.
		3. Calcitonin	C. stimulates the release of glucose sugar from liver cells.

D In the opposite electric circuit

If the potential difference between the two ends of the resistance = 18 volt.

Calculate the reading of the ammeter.



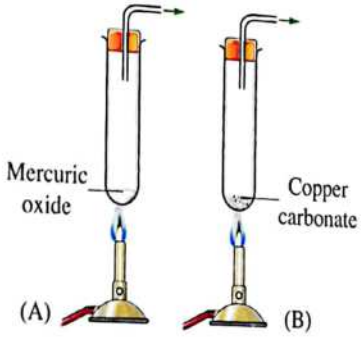
Question 2

A Correct the underlined words :

1. In **positive catalytic** reactions, catalyst is used to slow down the chemical reaction.
2. $2N_2O_5 \longrightarrow 4NO_2 + N_2\uparrow$
3. The transference of electric charges between two conductors depends on **the electric current intensity passing through** the two conductors.
4. The measuring unit of absorbed radiation is **Rontgen**.

B Compare between :

1. Colour of the substance in the tubes A and B after heating.
2. Oxidizing agent and reducing agent according to losing and gaining electrons.
3. The hereditary traits and the acquired traits according to transferring through generations.



4. Mendel's first law and Mendel's second law according to the name of each law.

C Illustrate by drawing, how to connect 3 electric cells :

The e.m.f of each is 3 volt to obtain a battery its e.m.f equals

1. 6 volt
2. 3 volt

Question 3

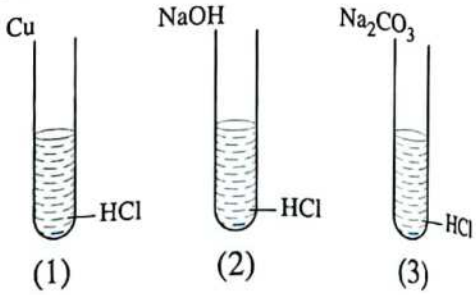
A Write the scientific term for the following statements :

1. It is the quantity of electric charges flowing in coulomb through a cross-section of a conductor in one second.
2. The cells which can be used to convert the chemical energy into electric energy.
3. A chemical message that controls and regulates the activities and functions of most of the body organs.
4. A disease caused by the decrease in the secretion of the insulin hormone.

B 1. Study the opposite figure, then answer :

a. In which tube the gas evolved.

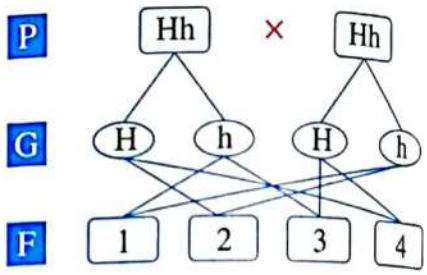
b. Mention the type of the reaction in tube 2.



2. The opposite figure represents the inheritance of one of humans' traits :

a. What is the number of the child that carries the recessive trait ?

b. What is the ratio of its appearance.



C Which of the following will rust faster and why :

Leaving an iron wire of 10 gm mass or iron filings have the same mass in humid place.

Question 4

A Choose the correct answer :

1. When there is a sudden decrease in the car speed, the sodium azid is decomposed into ..... gas.

   a. N_2 b. H_2 c. O_2 d. CO_2

2. The rate of chemical reaction is increased by rising temperature due to increasing .....

   a. the surface area exposed to the reaction.

   b. the number of molecules.

   c. the number of probable collisions between molecules.

   d. the concentration of the reactants.

3. In the electric circuit, the sliding rheostat is used to .....

   a. measure the electric current intensity. b. measure the potential difference.

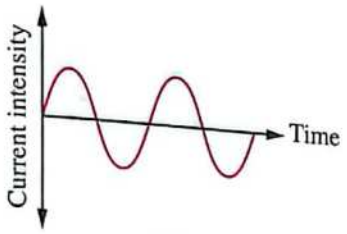
   c. change the resistance value. d. open and close the circuit.

4. Improving of some plant races is from the uses of nuclear energy in the ..... field.
a. medical b. drilling c. industrial d. agricultural

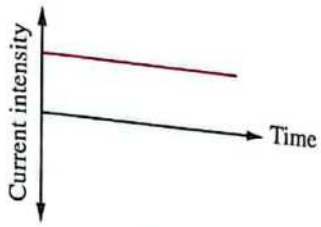
B 1. Which of the two following graphs :

a. Expresses the current which is able to transmit for long distances.

b. Is used in electroplating processes.

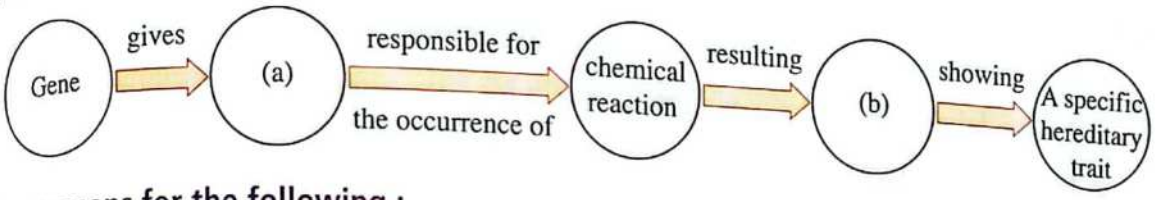


(1)



(2)

2. Complete the following diagram :



C Give reasons for the following :

1. The fridge is used to preserve food.
2. Not keeping silver nitrate solution in aluminum containers.

13 Suez Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. Active metals substitute ..... of water and produce metal hydroxide.
2. There are two sources of radiation pollution ..... and .....
3. The trait that appears in all individuals of the first generation in Mendel's experiments is known as .....

B 1. What happens in the following cases ?

a. Heating of blue copper sulphate.

b. When the individual carries a recessive gene from both parents.

2. What is the importance of each of the following ... ?

a. The nucleic acid DNA. b. The endocrine glands.

C If the work done to transfer an electric charge of 600 coulombs between two points in a time 5 minutes equals 3600 joules. Calculate :

1. The current intensity.
2. The potential difference between the two points.

Question 2

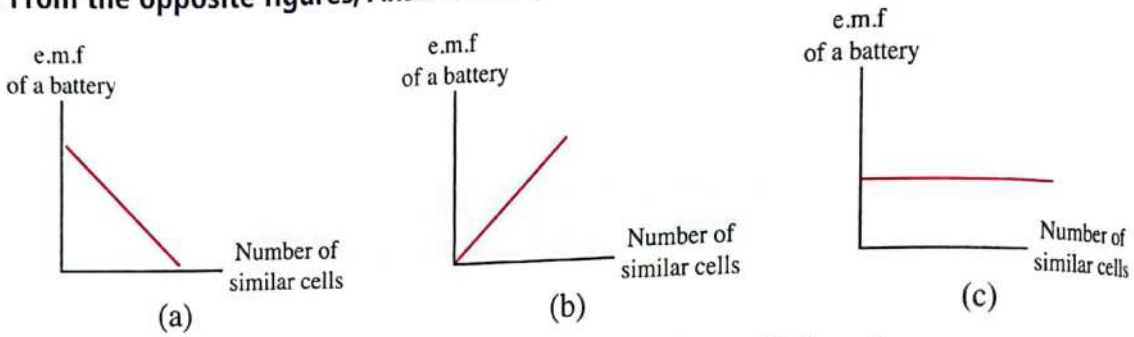
A Correct the underlined words :

1. Sodium nitrates decompose by heating into sodium nitrite and **nitrogen** gas evolves.
2. The **pure** individual carries a different pair of genes (hereditary factors) one is dominant and the other is recessive.
3. When the level of sugar decreases in the blood, pancreas secretes the **insulin** hormone.
4. The reactions of ionic compounds are **slower** than that of the covalent compounds.

B 1. Give reasons for :

1. A white precipitate is formed on adding silver nitrate solution to sodium chloride solution.
2. Mendel selected the pea plant to conduct his experiments. (2 points only)

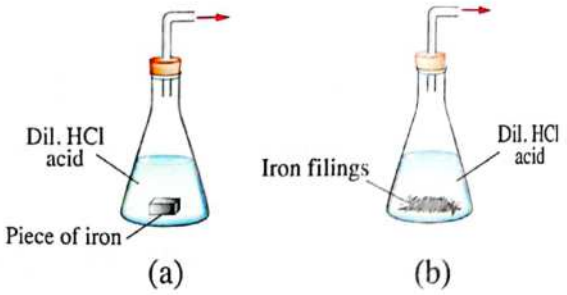
2. From the opposite figures, Answer the questions :



1. Fig ..... represents the connection of several similar cells in series.
2. Fig ..... represents the connection of several similar cells in parallel.

C From the opposite figures, Answer :

1. Which reaction is faster (a) or (b).
2. What happens if iron is replaced by copper ?



Question 3

A Choose the correct answer :

1. The element which is more active in the series of chemical activity is .....
   a. gold. b. hydrogen.
   c. sodium. d. aluminum.
2. The electric current intensity passing through a conductor whose resistance is one ohm and the potential difference between its terminals is one volt is .....
   a. ohm. b. ampere.
   c. coulomb. d. volt.

3. The hormone responsible for the appearance of the female secondary sex characters is .....
   a. estrogen. b. testosterone.
   c. adrenalin. d. thyroxin.

4. At the beginning of the chemical reaction, the percentage of the reactants concentration is ..... %
   a. zero b. 25
   c. 50 d. 100

B 1. When you pollinate a pure tall stem pea plant with a short stem pea plant, it produces plants all are tall stem.
Use the symbols in expressing the results of this crossing.

2. Complete the following equations :

1. $H_2 + CuO \xrightarrow{\Delta} \ldots\ldots + H_2O$

2. $Na_2CO_3 + 2HCl \longrightarrow \ldots\ldots + H_2O + \ldots\ldots$

C What is meant by ... ?

1. The catalyst.

2. Radioactivity phenomenon.

Question 4

A Write the scientific term :

1. A chemical process in which an atom gains one electron or more.

2. The flow of electric negative charges (the electrons) in a conducting substance (metal wire).

3. The reaction between an acid and an alkali to form salt and water.

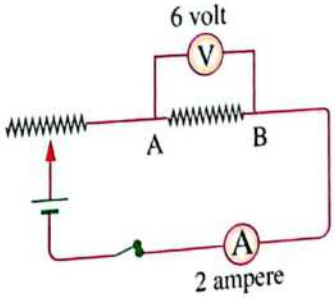
4. The gland that secretes calcitonin hormone.

B Compare between :

1. Direct current and Alternating current. (2 points only)

2. Hereditary traits and acquired traits.

C From the opposite circuit, complete the following :



1. The type of resistance A B is .....

2. The value of the resistance A B = ... ohms.

14 Port Said Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. ..... is measured by using the voltmeter and has a measuring unit known as .....
2. Chromosome is chemically consisted of a nucleic acid called ..... bind with .....
3. Electric current is generated from the dynamo due to the converting ..... energy to ..... energy.
4. Mendel chose the garden pea plant because of its ..... life cycle and its fast .....

B Compare between :

1. Ionic compounds and covalent compounds (from point of view of speed of reactions).
2. Dwarfism and exophthalmic goiter (from point of view of reason of occurrence).

C Calculate the potential difference between the terminals of a vacuum cleaner of a resistance 22 ohm and the current passes through it is 10 ampere.

Question 2

A Write the scientific term :

1. The change in the concentration of the reactants and products at a unit time.
2. A chemical reaction in which a metal replaces another metal in one of its salt solutions.
3. The flow of negatively electric charges through a conductor.
4. The spontaneous decay of the atoms' nuclei of some elements that are present in nature in an attempt to achieve a more stable composition.

B Put (✓) or (✗) :

1. When a pure short stem pea plant is pollinated with a hybrid long stem one all produced plants are short stem. ( )
2. Oxidation and reduction are not concurrent processes. ( )
3. Sweet potato contains oxidase enzyme which acts as a catalyst. ( )
4. The free ear lobe is a dominant trait in the human being. ( )

C You have four similar cells, the electromotive force of each is 1.5 volt.
Explain by using two diagrams how you can connect them to obtain an e.m.f of 3 volts.

Question 3

A Choose the correct answer :

1. The ..... hormone liberates the needed energy from the food stuff.
   a. growth b. esterogen c. thyroxin d. adrenalin
2. The radioactive phenomenon was discovered by the scientist .....
   a. Ohm. b. Becquerel. c. Ampere. d. Mendel.
3. Insulin hormone is secreted by .....
   a. liver. b. pancreas. c. thyroid gland. d. pituitary gland.
4. From the characteristics of alternating current .....
   a. only constant intensity. b. only variable direction.
   c. variable intensity and direction. d. only variable intensity.

B Define each of the following :

1. Acquired traits
2. Gametes
3. Neutralization reaction
4. Reduction

C Illustrate by balanced symbolic equations the effect of heat on copper sulphate then passing of hydrogen gas through the resultant.

Question 4

A Choose from column (B), what suit it in column (A) :

(A)	(B)
1. Used to control the electric resistance of the circuit	a. red precipitate is formed
2. When adding copper to dilute hydrochloric acid	b. white precipitate is formed
3. Used to measure the electric current intensity	c. rheostat
4. When magnesium replaces copper in one of its salt solutions	d. no reaction
	e. ammeter

B Correct the underlined words :

1. Measuring unit of electromotive force is **coulomb**.
2. The resistance of a conductor is **ten** ohms when the potential difference of one volt between its ends produces a current of one ampere.
3. Mendel's first law is called law of **independent assortment of the hereditary factors**.
4. Mendel removed the stamens of flowers of pea plant before the another becomes mature to prevent the **cross** pollination.

C How can you distinguish between magnesium sulphate solution and copper sulphate solution by using a piece of zinc ?

15 Fayoum Governorate

Answer the following questions :

Question 1

A Complete the following :

1. The ..... apparatus is used to measure the current intensity while the ..... apparatus is used to measure the potential difference.
2. The sources of radiation pollution are divided into ..... sources and ..... sources.
3. According the Mendelian heredity, straight hair trait is a ..... trait while the presence of dimples in the face is a ..... trait.
4. ..... is a science that researches the transmission of the hereditary traits from ..... to the offspring.

B Correct the underlined words in the following statements :

1. **Oxidation** reaction is the reaction between an acid and an alkali to form salt and water.
2. Most metal carbonates decompose by heating to **metal** and carbon dioxide.
3. **Duct** glands secrete hormones in the human body.
4. **The iron** element shares in composing thyroxin hormone.

C Calculate the quantity of electricity that passes through a conductor of resistance 1000 ohm for 30 minutes, if the potential difference between its terminals equals 220 volt.

Question 2

A Choose the correct answer to complete the following statements :

1. The physical quantity which its measuring unit equivalent (volt / ampere) is .....
   a. current intensity. b. electric resistance.
   c. potential difference. d. quantity of electricity.
2. The rate of the chemical reaction increases by rising temperature due to increasing of .....
   a. surface area exposed to reaction.
   b. numbers of molecules.
   c. number of probable collisions between molecules.
   d. no correct answer.
3. Oxygen gas is produced when ..... compound decomposes by heat.
   a. $NaNO_3$ b. $CuCO_3$ c. $CaSO_4$ d. $Cu(OH)_2$
4. From properties of the direct current is .....
   a. constant intensity only. b. variable direction.
   c. variable intensity and direction. d. constant intensity and direction.

Write the scientific term for each of the following statements :

1. The substance which loses one or more electrons during a chemical reaction.
2. The change in the concentration of the reactants and resultants at a unit time.
3. Plant that Mendel chose in his experiments.
4. It is chemically consisted of a nucleic acid called DNA connected with protein.

You have three similar cells, the electromotive force of each is 2 volt, explain by using a diagram how you can connect them to obtain the e.m.f. of :

1. 6 volt
2. 2 volt

Question 3

Exclude the unsuitable word or sentence and mention what the rest has in common :

1. Pituitary gland – salivary gland – Thyroid gland – Pancreatic gland.
2. Master gland – Two lobes – Pituitary gland – Thyroid gland.
3. Pressure – Potential difference – Current intensity – Electric resistance.
4. Radium – Uranium – Sodium – Zirconium.

Choose from column (B), what suits it in column (A) :

(A)	(B)
1. Manganese dioxide	a. are always pure.
2. Reacting sodium with water	b. cannot transmitted from one generation to another.
3. Acquired traits	c. catalysts.
4. Recessive traits	d. simple substitution reaction.
	e. precipitation.

Show by the balanced symbolic equations the following reactions :

1. Adding silver nitrate solution to sodium chloride solution.
2. The effect of heat on copper sulphate.

Question 4

Give an example for :

1. The physical quantity which is measured with a measuring unit (ampere).
2. Military use for nuclear energy.
3. Reaction which is very slow.
4. Reaction takes very short time.

B Put (✓) or (✗) then correct the wrong ones :

1. Fixed resistance cannot be controlled but rheostat can be controlled. ( )
2. The measuring unit of absorbed radiation by human body is curie. ( )
3. Mendel's second law is called the law of independent assortment of hereditary factors. ( )
4. The wide eyes and narrow eyes are hereditary traits. ( )

C What would happen in each of the following ... ?

1. Putting flame of the match stick near to the top of the tube after heating red mercuric oxide. ( )
2. Increasing the concentration of the reactants. ( )

16 Beni-Suef Governorate

Answer the following questions :

Question 1

A Complete the following statements :

1. The law of independent assortment of hereditary factors is ..... Mendel law.
2. Force of ..... is considered as the source which provides the atom with a huge energy.
3. Each hereditary trait is controlled by hereditary factors which separate when the ..... are formed.
4. To measure electric current intensity ..... apparatus is connected as series in electric circuit.

B Put sign (✓) in front of correct answer or (✗) in front of wrong one :

1. Oxidation is a chemical process that an atom loses one proton or more. ( )
2. Hormones are secreted from special organs known as endocrine glands. ( )
3. Thyroid gland secretes adrenalin hormone that reduces level of sugar in the blood. ( )
4. Increases surface area of reactants increases speed of chemical reaction. ( )

C Show by drawing and calculate the electromotive force for electric cell to connect 3 cells e.m.f for each one 2 volt :

1. As series connection.
2. As parallel connection.

Question 2

A Choose the correct answer :

1. Which of the following substances don't form a black precipitate after heating .....
   a. copper carbonate. b. copper sulphate.
   c. sodium nitrate. d. copper hydroxide.
2. By increases concentration of reactants the number of collisions .....
   a. decreases. b. increases.
   c. stopped. d. increases then decreases.
3. When the quantity of electric charges is doubled when the time is constant so electric intensity .....
   a. decreases to half. b. increases four times.
   c. increases twice. d. decreases to quarter.
4. From radioactive elements .....
   a. radium. b. copper. c. gold. d. silver.

B Complete the following sentences by using the following words :
(hydrogen gas – oxygen gas – recessive trait – dominant trait – nitrogen gas)

1. Trait always pure is .....
2. Aluminium reacts with dilute acids and ..... evolved and burned with pop sound.
3. A hereditary trait appears by mating a dominant trait with recessive one is .....
4. Mercuric oxide is decomposed by heating and ..... evolved that increases glowing of splint.

C Find a potential difference between terminals of conductor its resistance (20 ohm) and its intensity (4 ampere).

Question 3

A Write the scientific term for each of the following statements :

1. It is the opposition that the electric current faces during its passage through a conductor.
2. It is an electric current which has a variable intensity and flow in two opposite directions in the electric circuits.
3. It is a chemical messages that control and organize most of vital activities in the bodies of living organisms.
4. A gland responsible for secretion a hormone which determines the height that the person will reach.

B Match between column (B), which suits in the column (A) and write a complete sentences in your answer sheet :

(A)	(B)
1. Exposure for large dosages in short time	a. is a acquired trait.
2. Exposure for small dosages in long time	b. is a recessive trait.
3. Ability of rolling tongue in the human is	c. is a dominant trait.
4. Learning swimming and new languages	d. causes damage spleen and centeral nervous system.
	e. chemical composition of the hemoglobin changes.

C Write a balanced chemical equation that indicates reaction of sodium chloride solution and silver nitrate solution.

Question 4

A Correct the underlined words :

1. The end of chemical reaction concentration of resulting are **equal to** concentration of reactants.
2. In the electric cells the **mechanical** energy converted into electrical energy.
3. Enzymes act to **constancy** speed of vital activities in the human body.
4. The potential difference between two terminals in an opened circuit represents **electric resistance** for the electric source.

B Choose the correct answer :

1. The measuring unit for potential difference is .....
   a. ampere. b. joule. c. volt. d. ohm.
2. Direct current is used in .....
   a. lighting streets. b. electroplating. c. lighting houses. d. operating factories.
3. On crossing a pure tall pea plant (TT) with a pure short pea plant (tt) in the second generation, the trait of shortness of stem appears with ratio .....%
   a. 100 b. 75 c. 50 d. 25
4. From the dominant traits in the human .....
   a. blue eyes. b. straight hair. c. curly hair. d. presence of freckles.

C Give a reason for :

Reactions between ionic compounds are fast while reactions between covalent compounds are slow.

17 El-Minia Governorate

Answer the following questions :

Question 1

A Complete the following statement by the suitable word from between the brackets :

(Radiations – gametes – H_2O – dynamo)

1. In every hereditary trait, there are two factors be separated during the formation of .....
2. The international unit for measuring ..... absorbed by human body is sievrt.
3. ..... changes kinetic energy to electric energy.
4. $NaOH + HCl \longrightarrow NaCl +$ .....

B Put (✓) or (✗) in front of the following statements :

1. Sweet potato contains oxidase enzyme and it works as a catalyst. ( )
2. Reducing agent is the substance which gains one electron or more during chemical reaction. ( )
3. Recessive traits are transmitted from one generation to another. ( )
4. Genetic modified rice is used to solve the problem of the vitamin (A) resulted from malnutrition. ( )

C If you have 4 electric cells e.m.f for each is 1.5 volt show by drawing only how to connect them to get a battery of e.m.f of : (4.5 volt - 6 volt).

Question 2

A Write the scientific term for each of the following statements :

1. The change in the concentration of reactants and products resulting from reaction per a unit time.
2. Metallic box found in modern cars for the treatment of harmful gases produced from burning fuel.
3. Electric current intensity resulting from passing quantity of electricity equals one coulomb through cross section of a conductor in time equals one second.
4. The resistance of an electric conductor for passing electric current its intensity 1 ampere passing through it when the potential difference between its terminals equals 1 volt.

B Correct the underlined words in the each statements :

1. Every hereditary trait in the living organism, two similar hereditary factors control it, in the **hybrid** person.
2. The second law of Mendel is known as **law of segregation of factors**.
3. The reaction of hydrochloric acid with iron filings is faster than its reaction with a piece equals in mass due to **high concentration**.
4. The reactions which happened to form oil inside the Earth **need many months**.

C If the work done to transfer electric charge 30 coulomb between two points, is equals to 3330 Joule. Calculate potential difference between the two points.

Question 3

A State one importance for each :

1. Sliding rheostat.
2. Nuclear reactors.
3. Adrenalin hormone
4. Glucagon hormone.

B Choose the correct answer :

1. On adding manganese dioxide powder to hydrogen peroxide solution, the quantity of manganese dioxide .....
   a. increases.
   b. decreases.
   c. affects on the start of reaction.
   d. does not change.
2. ..... is chemically consisted of nucleic acid bind with protein.
   a. Cytoplasm
   b. Gene
   c. Chromosome
   d. No correct answer.
3. From recessive traits in human being is .....
   a. presence of check dimples.
   b. narrow eyes.
   c. wide eyes.
   d. curly hair.
4. On sudden and fast decrease in the speed of car, sodium azid is decomposed and ..... gas is evolved.
   a. N_2 b. H_2 c. O_2 d. CO_2

C Give a reason for :

The reactions between ionic compounds are faster than that of covalent compounds.

Question 4

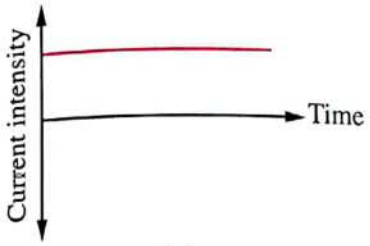
A What happens in each cases ...?

1. Heating Mercuric oxide (with writing equation).
2. If two charged conductors differ in their electric potential, are connected together.
3. If a person subjected to a large dose of radiation during a short period of time.
4. On putting a small piece of sodium in water.

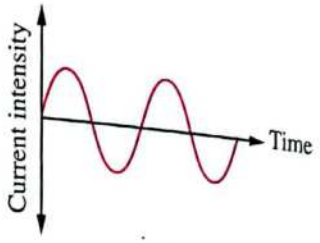
B Choose from column (A), what suits it in column (B) :

(A)	(B)
1. Sodium nitrate decomposes by heating	a. Dr. Ali Mostafa Mosharafa.
2. Aluminium replaces hydrogen of dilute acid	b. and produces yellowish white substance and oxygen gas evolved.
3. Egyptian scientist has theories in the fields of atom and radiation	c. scientist Mendel
4. The discovery of radioactivity phenomenon is related to	d. salt of an acid is formed and hydrogen gas evolved.
	e. scientist Henry Becquerel

C Study the figures in front of you then answer :



(a)



(b)

What is the current which represents figure (a) and which of them can be transmitted for long distances ?

18 Assiut Governorate

Answer the following questions :

Question 1

A Choose the correct answer :

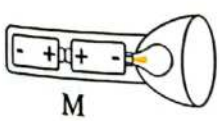
1. At the decomposition of sodium nitrates by heating ..... gas evolves.

a. NO b. O_2 c. H_2 d. CO_2

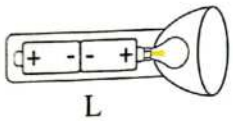
2. The ..... hormone controls the level of calcium in the human body.

a. calcitonion b. thyroxin c. adrenalin d. progesterone

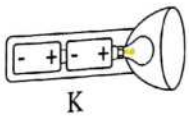
3. The following figures show : - A flashlight and three ways to connect two batteries



M



L



K

Which of the following methods must be connected to the batteries in order to turn on the lamp .....

a. figure K only. b. figure L only. c. figure M only. d. no correct answer.

4. The measuring unit of absorbed radiation is the .....
   a. roentgen. b. curie. c. sievert. d. coulomb.
5. Which one of these traits is recessive in human ? .....
   a. Curly hair. b. Wide eyes. c. Straight hair. d. Free ear lobe.

B What happens when ... ?

1. Adding diluted HCl to the copper.
2. The effects of exposure to a large dosage of radiation for a short time.
3. Increasing the surface area exposed to reaction "related to the rate of the reaction".

C From the following table :

1. Write the equation of the reaction of sodium with chlorine to from sodium chloride.
2. Determine the oxidizing agent and reducing agent and state the reason.

Element	Atomic number	Electronic configuration		
		K	L	M
Sodium Na	11	2	8	1
Chlorine Cl	17	2	8	7

Question 2

A Complete the following :

1. Mendel's first law is known as the law of .....
2. The reaction of the covalent compounds are ..... than that of ionic compounds.
3. Nuclear energy is used in medical field to .....
4. The unit that is used in measuring work is .....
5. At the end of the reaction, the concentration of the reactants is ..... %

B Choose from column (B), (C) what suits it in column (A) :

(A)	(B)	(C)
1. The electric potential difference	a. it has a variable intensity and direction	f. ohmmeter.
2. Uranium	b. coulomb / second	g. radioactive element.
3. The alternating electric current	c. unstable	h. voltmeter.
	d. joule / coulomb	i. it is used in lighting and operating electric appliances.
	e. it has a constant intensity and direction	

C Use symbols to express the results from the pollination between : Long stem green pod pea plant with another short stem yellow pod pea. Showing parents, gametes and first generation.

Question 3

A Write the scientific term for each of the following statements :

1. A substance that increases the speed of the chemical reaction without interfering in it or being consumed.
2. A science that researches the transmission of the hereditary traits from one generation to another by the studying the similarities and differences between the parents and their offspring.
3. The opposition that the electric current faces during its flow in the conductor.
4. They are parts of DNA on the chromosomes and control the hereditary traits of the individual.
5. The reaction between an acid and an alkali to from salt and water.

B Illustrate by balanced symbolic equations the following reactions :

1. The reaction of water with sodium.
2. The effect of heat on red mercuric oxide.
3. The reaction of sodium carbonate with diluted hydrochloric acid.

C Mahmoud bought a toy which is operating by electromotive force its value equals 6 volt, and he has five electric cells e.m.f of each cell is 2 volt, and he wanted to operate this toy. Explain how the connection of these cells is completed ? with drawing.

Question 4

A Put (✓) or (✗) in front of the following sentences :

1. The series of chemical activity is an arrangement of the metals in a descending order according to their atomic weight. ( )
2. Mendel removed the petals from flowers of pea plant to prevent the self-pollination. ( )
3. In electric cells and batteries, chemical energy is converted into electric energy. ( )
4. The iron element shares in composing thyroxin hormone. ( )

B Give reasons for :

1. Ahmed objected to keep the silver nitrates solution in an aluminium container.
2. Rheostat is used in some electric circuits.
3. The nucleus is the energy store.

C What is meant by ...?

1. Mendel's second law. 2. Hormones. 3. Chemical reaction.

19 Sohag Governorate

Answer the following questions :

Question 1

A Complete the following :

1. The ..... apparatus is used to measure the electric current intensity.
2. The resistance that faces the flow of electric current in a conductor is known as the .....
3. ..... are parts of DNA present on the chromosomes and control the hereditary traits of the individuals.
4. ..... traits are not transmitted from one generation to another.

B Choose from column (A), what suits it in column (B) :

(A)	(B)
1. Catalyst	a. it is breaking up of bonds in the reactant molecules and formation of new bonds in the products molecules.
2. Chemical reaction	b. the hormone responsible for the appearance of male secondary sex characteristics.
3. The hormone	c. a chemical substance which changes the rate of reaction without being changed.
4. Testosterone	d. the chemical substance that controls and regulates the functions and the activities of most of body organs.
	e. chemical reactions in which one element substitutes another less active element in a solution of one of its compounds.

C A battery consists of three electric cells, the electromotive force of each cell is 2 volt. Calculate the e.m.f of the battery when the cells are connected in parallel.

Question 2

A Write the scientific term for each of the following statements :

1. The arrangement of metallic elements in a descending order according to the degree of their chemical activity.
2. The change in the concentration of the reactants and resultants in a unit time.
3. The electric current intensity is directly proportional to the potential difference between two terminals of a conductor at constant temperature.
4. It is the spontaneous decay of the atoms' nuclei of some radioactive elements that are present in nature in an attempt to achieve a more stable composition.

A Choose the correct answer :

1. A chemical process which causes the increase in the oxygen percentage or the decrease in the hydrogen percentage in a substance .....
   a. oxidizing agent. b. oxidation. c. reduction.
2. ..... gas evolves, when nitrogen pentoxide decomposes.
   a. Nitrogen b. Carbon dioxide c. Oxygen
3. Mendel's second law is known as the law of ..... of hereditary factors.
   a. segregation. b. coulomb. c. independent assortment.
4. Which of the following traits is dominant in human being ? .....
   a. Curly hair. b. Narrow eyes. c. Attached ear lobe.

B Compare between, the direct current and alternating current (Concerning the field of using only).

Question 3

A Put (✓) in front of the correct answer or (✗) in front of wrong one :

1. Radium and uranium are from the natural radioactive substances.
2. In dynamo, the chemical energy changes into electric energy. ( )
3. Simple goiter is resulted due to thyroxin hormone deficiency. ( )
4. Pancreas secretes glucagon hormone to decrease the level of glucose in blood. ( )

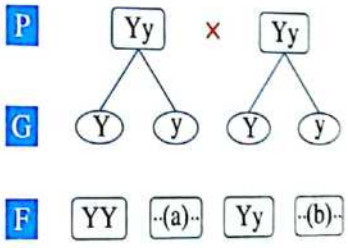
B 1. Find the unsuitable word :

The nature of the reactants – The concentration of the reactants – The substitution reaction – The temperature of reactants.

2. Mention the type of the chemical process in the following reaction.

$$Cl_2 + 2e^- \longrightarrow 2Cl^-$$

3. Complete the opposite diagram, that illustrates self-pollination between two pea plants of hybrid yellow seeds.



C Illustrate by balanced symbolic chemical equation the following reaction :
The reaction of dil. hydrochloric acid with sodium hydroxide.

Question 4

A Correct the underlined words in the following statements :

1. Cosmic radiation is from **artificial** sources of radiation pollution.
2. The voltmeter is connected in **series** in the electric circuits.
3. Most metal carbonates decompose by heating into **metal** and carbon dioxide.
4. When adding silver nitrate solution to sodium chloride solution, a **blue** precipitate is formed

B Choose the correct answer from brackets, and put it in the suitable place in the following statements :

(sievert – ohm – hybrid – the principle of complete dominance – volt)

1. ..... is the electric resistance of a conductor that 1 ampere is passed through it when the potential difference between its two terminals is 1 volt.
2. ..... is the measuring unit of absorbed nuclear radiation.
3. The appearance of a dominant hereditary trait in the individuals of the first generation when two individuals are crossed, one of them carries a pure trait contrasting the trait carried by the other individual is known by .....
4. ..... is the individual that carries the impure trait.

C Give a reason for :

The covalent compounds are slow in their chemical reactions.

20 Qena Governorate

Answer the following questions :

Question 1

A Complete the following :

1. Mendel's first law is called the law of .....
2. The potential difference between two terminals of a conductor is ..... proportional to the intensity of the electric current passing through it at a constant temperature.
3. Chromosome is chemically composed of a nucleic acid called DNA which is combined with .....
4. ..... energy is used in the drilling of petroleum and underground water.

B Put (✓) or (✗) in front of the following sentences :

1. Ovary secretes the progesterone hormone. ( )
2. Oxidation and reduction are two separated processes. ( )
3. When the amount of glucose decreases in the blood, pancreas secretes glucagon hormone. ( )
4. The reactions of ionic compounds are fast. ( )

C You have three similar electric cells, the electromotive force (e.m.f.) of each is 3 volt, show by drawing only how can you connect them together to obtain a battery of electromotive force (e.m.f.) of 6 volt ?

Question 2

A Write the scientific term for each of the following statements :

1. The breaking up of bonds between molecules of the reactants and formation of new bonds between the molecules of the products.
2. The opposition that the electric current faces during it passing through a conductor.
3. A chemical substance which changes the speed of a chemical reaction without being changed.
4. A device used to measure the electric current intensity passing in the electric circuit.

B Correct the underlined words :

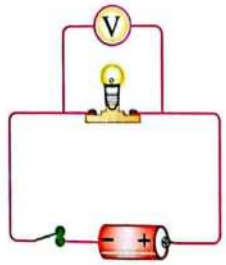
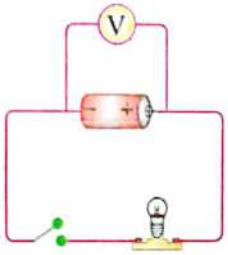
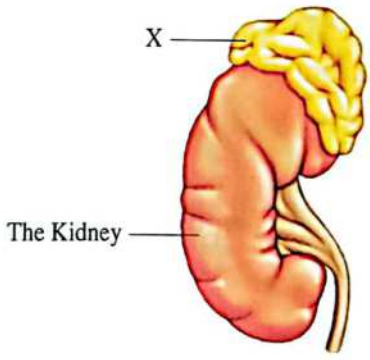
1. In the chemical activity series, the metallic elements are arranged in a descending order according to their **atomic weights**.
2. Learning of walking in children is **a hereditary** trait.
3. The scientist **Mendeleev** is considered as the founder of heredity.
4. The chemical formula of nitrogen pentoxide gas is **NO_2**.

C Give a reason for :

The fridge is used to preserve food.

Question 3

A From the figures in front of you answer what is required below :

1. From two following figures		2. In the following figure
 (A)	 (B)	
A. In figure (A) the voltmeter is used to measure		A. The gland (x) is called ..... gland.
B. In figure (B) the voltmeter is used to measure		B. The gland (x) is secretes ..... hormone.

B Cross out the unsuitable word (or the sentence) in the following :

1. Radium – Zirconium – Iron – Uranium.
2. Free ear lobe – Wide eyes – Presence of freckles – Presence of dimples.
3. Current produced from electric generators – Current constant in intensity - Current constant in direction – Current is used in electroplating processes.
4. Genes are parts of the DNA – Genes are present in the cytoplasm – Every gene gives an enzyme – Genes control hereditary traits.

C In the following reaction :

$$H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$$

Determine the oxidizing agent and reducing agent ?

Question 4

A Choose from column (B), what suits it in column (A) :

(A)	(B)
1. The reaction of zinc with dilute hydrochloric acid is considered as	a. sievert.
2. The measuring unit of absorbed radiation is	b. ohm.
3. From the factors that affect the speed of the chemical reaction	c. concentration of reactants.
4. The measuring unit of the electric resistance is	d. simple substitution reaction.
	e. neutralization reaction.

B Choose the correct answer :

1. If a quantity of electricity of 20 coulombs passes in 10 seconds through a cross-section of a conductor, so the intensity of the electric current equals ..... ampere.
   a. 200 b. 30 c. 10 d. 2
2. According to Mendel's second law, the dominant traits appear in the second generation at a percentage of ..... %.
   a. 100 b. 75 c. 50 d. 25
3. The ..... effects of radiation are results of changing the sex chromosomes in the cells.
   a. physical b. genetic c. cellular d. all the previous
4. The two scientists ..... discovered the means of how the genes control the appearance of hereditary traits.
   a. Badel and Tatum b. Watson and Crick c. Badel and Crick d. Watosn and Badel

C Illustrate by a balanced symbolic equation the following reaction :

The effect of heat on sodium nitrate.

21 Luxor Governorate

Answer the following questions :

Question 1

A Complete the following :

1. Nuclear energy can be used in ..... field to convert sand to silicon sheets.
2. Free ear lobe from the ..... traits in human.
3. The ..... apparatus is used to measure the resistance.
4. Mendel's first law is called .....

B What are the results of :

1. Reaction of hydrochloric acid with sodium hydroxide.
2. Deficiency of growth hormone secretion during childhood.
3. Adding a negative catalyst to a rapid reaction.
4. The pancreas secretes the insulin hormone.

C You have two currents, one of them is resulted from electrochemical cell and the other is resulted from electric generator, which of them you preferred ? Why ?

Question 2

A Choose the correct answer :

1. The oxygen gas evolves by the thermal decomposition of ..... compound.

   a. $CaSO_4$ b. $CuCO_3$ c. HgO d. $Cu(OH)_2$

2. ..... is the quantity of charge that transferred by a constant current intensity of one ampere in one second.

   a. Coulomb b. Volt c. Joule d. Ohm

3. Iron filings react with diluted hydrochloric acid faster than a piece of iron that has the same mass due to .....

   a. increasing of concentration. b. presence of catalyst.

   c. increasing of surface area. d. equal masses.

4. The sliding rheostat is used to ..... in the electric circuit.

   a. measure potential difference b. change the resistance

   c. measure current intensity d. measure the e.m.f

B Correct the underlined words :

1. **Hydrogen** is considered the oxidizing agent in the reaction : $H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$
2. According to Mendel's first law, the ratio of one pair of hereditary traits in the second generation is **1 : 1**
3. On adding silver nitrate solution to sodium chloride solution, **a brown** precipitate is formed.
4. The two factors of a hereditary trait are different in the **pure** individual.

C Explain the relation between the cellular effects of the radiation and the blood hemoglobin ?

Question 3

A Write the scientific term for each of the following statements :

1. The measuring unit of the absorbed radiation by human body.
2. Ductless glands that secretes their hormones directly in the blood stream.
3. The current intensity passing through a conductor whose resistance is one ohm when the potential difference between its terminals is one volt.
4. The disease which is caused by the increase in the secretion of thyroxin hormone.

B 1. From the following equation, answer :

$$2A \xrightarrow{\Delta} 2\,NaNO_2 + B$$

1. write the chemical formula for (A)
2. write the name of gas (B)

2. Use symbols to express the results from the self-pollination of a hybrid yellow seeds pea plant :

1. showing parents, gametes and first generation.
2. write the final ratio.

C (1) Explain "oxidation and reduction are concurrent processes"

Question 4

A Mention one importance for :

1. Chemical reactions.
2. Air bags.
3. The peaceful uses of nuclear energy in medical field.
4. Ammeter.

B 1. You have three electric cells, the e.m.f. of each of them is 1.5 volt, show with drawing the total e.m.f. when connecting them :

1. in series.
2. in parallel.

2. Use symbols to express the mating between man with black hair (Bb) with a woman has light colour hair (bb), showing the parents, gametes and first generation.

C Give reason : Adding manganese dioxide powder to hydrogen peroxide solution.

22 Aswan Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. ..... is used to generate an alternating electric current.
2. $NaOH$ + ... $\longrightarrow NaCl + H_2O$
3. The presence of check dimples in human of the ..... genetic traits.
4. Sodium chloride powder reacts ..... than a cube of sodium chloride of the same mass.

B Choose from column (B), what suits it in column (A) :

A. Physical quantities	B. Measuring units
1. Electric resistance	a. Joule
2. Electromotive force	b. Ampere
3. Quantity of electricity	c. Coulomb
4. Work	d. Ohm
	e. Volt

C What happens when :

Heating of green copper carbonate (write the reaction chemical equation).

Question 2

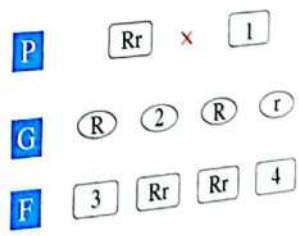
A Write the scientific term for each of the following statements :

1. When two individuals bearing a pair or more of contrasting traits are crossed, the trait of each pair is inherited independently of the others and appears in the second generation at a ratio of 3 : 1
2. A chemical process in which the atom gains one electron or more.
3. The process of spontaneous decaying of atoms of some elements present in nature to reach a more stability.
4. The breaking up of bonds of the reactants molecules and the formation of new bonds in the products molecules.

B The following figure :

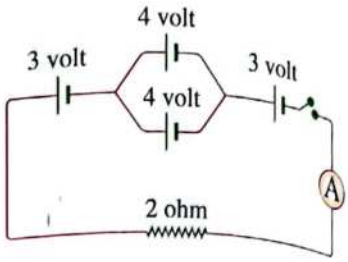
Show the process of self pollination in pea plant red hybrid flowers.

Replace the number in the figure with the appropriate symbols.



C In the following electric circuit :

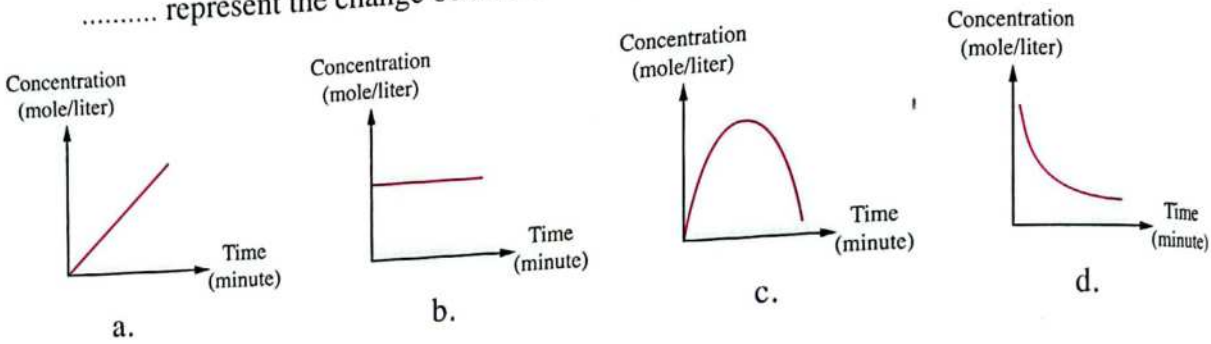
Calculate the reading of ammeter.



Question 3

A Choose the correct answer :

1. On adding sodium chloride solution to silver nitrate, a ..... precipitate is formed.
   a. black b. red c. blue d. white
2. The volt equals .....
   a. $\frac{\text{coulomb}}{\text{ampere}}$ b. ampere × second c. $\frac{\text{joule}}{\text{coulomb}}$ d. $\frac{\text{coulomb}}{\text{second}}$
3. Genes control the appearance of a genetic traits of living organism by producing .....
   a. hormones b. enzymes c. fats d. vitamins
4. On the reaction of magnesium ribbon with diluted hydrochloric acid, then the figure ..... represent the change occurs on the hydrochloric acid concentration.

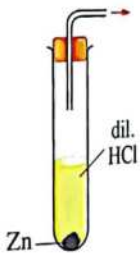


B Select the odd word in the following :

1. Sodium – Potassium – Silver – Aluminium. (In terms of chemical activity)
2. Voltmeter – Ammeter – Ohmmeter – Barometer. (In terms of use in the electrical circuit)
3. Radium – Iron – Uranium – Rubidium.
4. Dwarfism – Gigantism – Diabetes – Cancer.

C In the opposite figure :

1. What is the name of the evolved gas ?
2. Mention the type of the chemical reaction.



Question 4

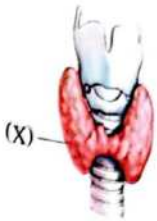
A Correct the underlined words :

1. Some radioactive materials are used as **fossil** fuel for a space rockets.
2. **A catalyst** is a substance which gives oxygen or takes away hydrogen during a chemical reaction.

3. The electric current intensity passing through a conductor is **inversely** proportional with the potential difference between its ends when the temperature is constant.
4. The **kinetic** energy is converted into electric energy in electric cells and batteries.

B In the opposite figure :

1. The name of (X) gland is .....
2. (X) gland is located in the front surface of the neck on both sides of the .....
3. (X) gland secretes ..... hormone that plays a main role in the food assimilation processes in the human body.
4. The enlargement of the (X) gland causes human disease called .....



C What is the role of ?

Oxidase enzyme which is found in sweet potato in the decomposition of hydrogen peroxide.

23 Red Sea Governorate

Answer the following questions :

Question 1

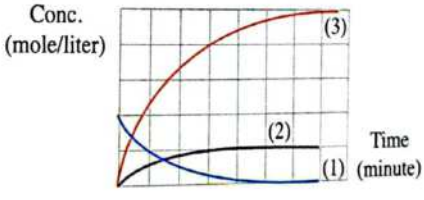
A Complete the following sentences :

1. $2HgO \xrightarrow{\Delta}$ ..... + ...
2. ..... gland secretes thyroxin hormone.
3. On connecting two charged conductors, the electric current passes from the conductor with ..... potential to the conductor which has ..... potential.
4. Chromosome is chemically composed of a nucleic acid DNA which is combined with .....
5. In oxidation and reduction reactions, metals are considered ..... factors, while nonmetals are considered ..... factors.

B The opposite graph illustrates :

The decomposition of nitrogen pentoxide according to the following equation :

$$2N_2O_5 \longrightarrow 4NO_2 + O_2\uparrow$$



Replace the numbers on the figure by suitable substances from the equation.

C Resistance of a conductor is 22 ohm and the amount of electricity passing through it is 20 coulomb in 2 seconds.

Calculate the potential difference between the two terminals of this conductor.

PART 3

Question 2

A Choose the correct answer :

1. Mendel covered ..... of the pistile of a pea plant to avoid cross pollination.
   a. stamens b. sepals c. stigmas d. petals
2. On adding silver nitrate solution to sodium chloride solution ..... precipitate is formed.
   a. red b. blue c. black d. white
3. The hormone responsible for the appearance of male secondary sex characters is the ..... hormone.
   a. estrogen b. testosterone c. insulin d. adrenalin
4. For measuring the electric resistance, the ..... apparatus is used.
   a. rheostat b. ammetre c. ohmmeter d. voltmeter
5. ..... are parts of DNA found in the nucleus of the cell.
   a. Genes b. Cytoplasm c. Gametes d. Hormones
6. The substance which changes the speed of the chemical reaction and doesn't change is known as .....
   a. oxidizing agent. b. catalyst. c. reducing agent. d. active agent.

B Compare between : Voltmeter apparatus and ammeter apparatus.

(according to symbol in the circuit – the way of connection in the circuit)

C Give reasons for :

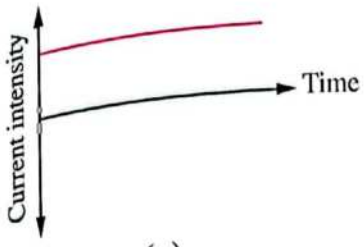
1. The blue colour of copper sulphate disappears on putting a piece of magnesium ribbon in it.
2. Some electric cells are connected in the electric circuit in series.

Question 3

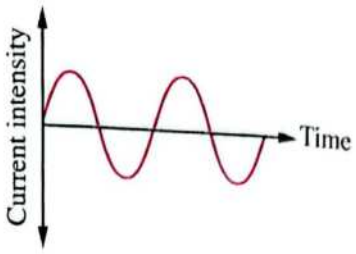
A Write the scientific term of each of the following statements :

1. A chemical process which causes the increase in the oxygen percentage or the decrease in the hydrogen percentage in a substance.
2. The traits that are transmitted from one generation to another.
3. The reaction between an acid and an alkali to give salt and water.
4. The physical quantity which its measuring unit is equivalent joule/volt.
5. An arrangement of the metallic elements in a descending order according to the degree of their chemical activity.

C From the following figures :



(a)



(b)

1. What is the type of electric current in each figure ?
2. What is the source of the electric current in each figure ?

D What happen in the following cases ... ?

1. Putting a small piece of sodium in water (with writing the balanced equation).
2. Decrease of secretion of growth hormone in the childhood.

Question 4

A Correct the underlined words :

1. The reactions of ionic compounds are **slower** than that of the covalent compounds.
2. Most metal carbonates decompose by heating into **metal** and carbon dioxide.
3. The electric current intensity passing through a conductor is **inversely** proportional to the potential difference between two terminals of a conductor at a constant temperature.
4. Wide eyes are from the **recessive** traits in the human.
5. The radioactive phenomenon was discovered by the scientist **Watson**.

B Use the symbols (Y) and (y) to express the results of mating between two pea plants both of them have hybrid yellow seeds.

(showing parents – gametes – the ratio of resulting generation)

C Mention one importance or use for each of the following :

1. Nuclear energy in medical field.
2. Insulin hormone.

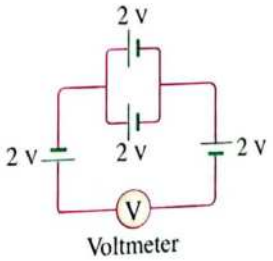
24 North Sinai Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. From the opposite figure :
   - Voltmeter reading = ... volt.
   - When all the electric cells are connected in series, the reading of voltmeter = ... volt.



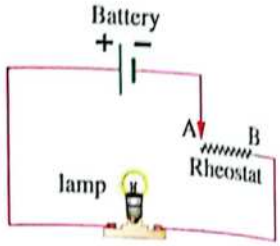
2. The name of the plant that Mendel chose to conduct his experiments is .....
3. The trait that appears in all individuals of the first generation in Mendel's experiments is called .....

B Write the scientific term of each of the following statements :

1. Organs secreting hormones in the human body.
2. A gland located below the brian and it consists of two lobes, each one secretes various types of hormones.
3. The breaking up of bonds of the molecules of the reactants and the formation of new bonds.
4. The catalyst that is used to slow down a chemical reaction.

C In the opposite figure :

What happens to the illumination of the lamp, when the slider of the rheostat moves from point A to point B and state the reason ?



Question 2

A Complete the following sentences :

1. The substance which gives oxygen or removes hydrogen is called .....
2. The change in the concentration of the reactants and products at a unit time is known as .....
3. The electric current is generated from a dynamo is a(an) ..... current and this current is ..... intensity and direction.

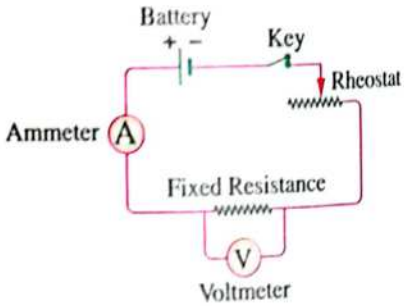
B Put (✓) or (✗) in front of the following statements :

1. Copper replaces gold in its salt solutions, while the opposite doesn't occur. ( )
2. The speed of chemical reaction decreases by increasing temperature. ( )
3. Electron is considered as an energy store of the atom. ( )
4. The bone marrow is the first to be affected by nuclear radiation. ( )

C In the shown figure in front of you :

If the reading of ammeter is 2 ampere and the reading of voltmeter is 8 volt calculate :

1. The value of resistance R.
2. The quantity of electricity passing through the circuit in one minute.



Question 3

A Choose the correct answer :

1. The radioactive phenomenon was discovered by the scientist .....
   a. Ohm. b. Becquerel. c. Ampere. d. Volt.
2. The flow of electric charges through a metal wire represents .....
   a. resistance. b. potential difference.
   c. electric current. d. current intensity.
3. The ..... hormone liberates the needed energy from the food stuff.
   a. insulin b. calcitonin c. growth d. thyroxin
4. The hormone responsible for the appearance secondary sexual male characteristics is the ..... hormone.
   a. progesterone b. testosterone
   c. estrogen d. adrenalin

B Complete the following sentences :

1. $HCl + NaOH \longrightarrow$ ..... + ...
2. Sodium chloride powder reacts ..... than a cube of sodium chloride which is equal in mass.
3. The ..... traits are transmitted from one generation to another.
4. The genes are DNA parts present on the .....

C If you know that the two elements X and Y have an atomic number of 11 and 17 respectively. Explain with the reasons which is an oxidizing agent and which is a reducing agent when forming a compound of them.

Question 4

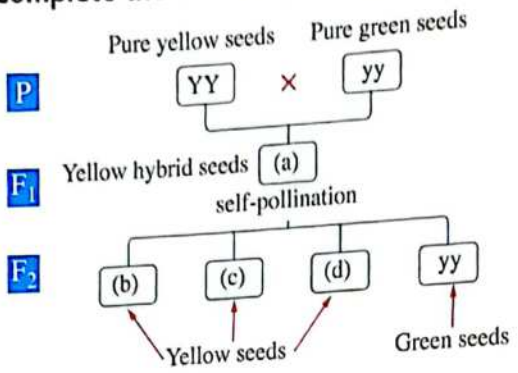
A Correct the underlined words :

1. Most metal carbonates decompose by heating into **metal** and carbon dioxide.
2. At the beginning of the reaction, the concentration of the reactants equals **50%.**
3. In the electric cell, **magnetic** energy is converted into electric energy.
4. The measuring unit of the **electric charge** is the Joule.

B First : Write the scientific term :

1. The electric current of constant intensity and direction.
2. The electric state of a conductor that shows the transference of electricity from and to it.

Second : Complete the following diagram :



C Illustrate by balanced symbolic chemical equations the following reactions :

1. The effect of heat on mercuric oxide.
2. Reaction of hydrochloric acid with the iron filings.

25 South Sinai Governorate

Answer the following questions :

Question 1

A Write the scientific term of each of the following statements :

1. The trait that appears in all individuals of the first generation in Mendel's experiments.
2. The cells in which chemical energy changes into electric energy.
3. Chemically composed of nucleic acid called DNA connected with protein.
4. The increase of the amount of nuclear radiation in the surrounding environment.

B What happens when ...?

1. Leaving the food outside refrigerator for a long period.
2. Deficiency secretion of growth hormone in childhood.
3. Adding dil. hydrochloric acid to a piece of zinc.
4. Decrease iodine salts in human food.

C Calculate potential difference between two poles of a vacuum cleaner.

Its resistance = 22 ohm and current intensity passes in it = 10 ampere.

Question 2

A Put (✓) or (✗) in front of the following sentences :

1. Iron rust is considered a fast reaction, while fireworks is considered a slow reaction. ( )
2. In dynamo, light energy changes into electric energy. ( )
3. Ammeter is used to measure current intensity passing in electric circuit. ( )
4. Most of metal carbonates decompose into metal and carbon dioxide on heating. ( )

B Complete the following sentences :

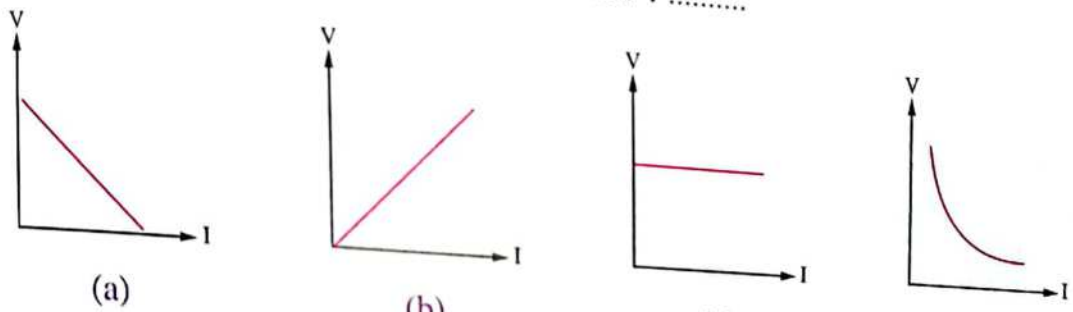
1. The substance that gives oxygen or takes hydrogen during chemical reaction is called .....
2. The founder of hereditary science is the scientist .....
3. Covalent compounds are slow in their chemical reactions, as the reaction occurs between .....
4. Each hereditary trait is controlled by two factors which separate during the formation of .....

C Illustrate with drawing the way of connection of three cells (e.m.f.) of each cell = 3 volt to obtain a battery its (e.m.f.) = 6 volt.

Question 3

A Choose the correct answer :

1. Pancreas secretes ..... hormone that decreases blood glucose level.
   a. glucagon b. progesterone c. Insulin d. estrogen
2. When electric current passes through a cross-section of a conductor and current intensity = 2 ampere in 20 minute, so quantity of electricity passes = ... coulomb.
   a. 10 b. 2400 c. 40 d. 20
3. In tension case ..... hormone increases.
   a. adrenalin b. thyroxin c. growth d. parathormone
4. Which of the following figures verify Ohm's law ? .....

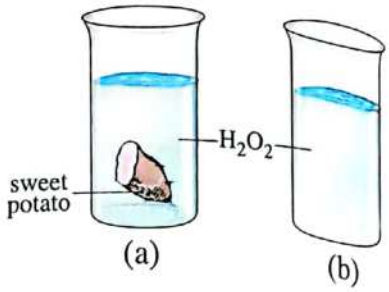


(a) (b) (c) (d)

B Match from column (B), what suits (A) :

(A)	(B)
1. When adding silver nitrate solution to sodium chloride solution.	a. hereditary traits.
2. Learning swimming is from	b. red precipitate is formed.
3. When adding magnesium to copper sulphate	c. acquired traits.
4. Blood group is from	d. white precipitate is formed.
	e. no precipitate is formed.

C **The two opposite figures illustrate two beakers which contain equal amount of hydrogen peroxide, one beaker contains a piece of sweet potato :**
What is the gas produced from Hydrogen peroxide dissociation ?



Question 4

A **Cross out the odd word :**

1. Reactant nature – Products concentration – Reaction temperature – Catalysts.
2. $\frac{\text{coulomb}}{\text{second}}$ – Ampere – $\frac{\text{Joule}}{\text{coulomb}}$ – $\frac{\text{volt}}{\text{ohm}}$
3. Sodium – Lead – Copper – Aluminium. (According to chemical activity)
4. Uranium – Cesium – Barium – Radium.

B **Correct the underlined words :**

1. Ohmmeter is used to measure **potential difference** in an electric circuit.
2. Genotype of pea plant with yellow colored pod is **Yy**.
3. Transfer of electric charges between two conductors depends on **current intensity** of two conductors.
4. When mating (Bb × Bb), so Genotype (BB) may appears in offspring with ratio **50%**

C **Illustrate by balanced symbolic equation the effect of heat on sodium nitrate.**

26 New Valley Governorate

Answer the following questions :

Question 1

A **Write the scientific term of each of the following statements :**

1. The transferred charge by a constant current of intensity one ampere in one second.
2. The traits that can't be transmitted from one generation to another.
3. A chemical process causes the decrease in the percentage of oxygen in the substance.
4. The gland which is responsible for secretion of a hormone that regulates amount of water in the body.
5. Spontaneous decaying of atoms' nuclei of radioactive elements present in nature in an attempt to achieve a more stable composition.

B **By symbolic balanced chemical equations. Explain the following :**

1. Heating of blue copper hydroxide.
2. The reaction between a small piece of sodium and water.

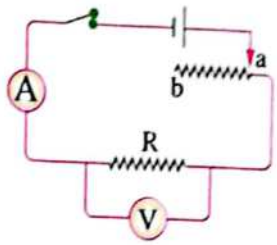
C Mention one importance or use for the following :

1. Nuclear energy in medical field.
2. Adrenalin hormone.
3. Ohmmeter device.

Question 2

A Choose the correct answer :

1. In the opposite closed electric circuit, when the slider of rheostat move from (a) to (b) the reading of voltmeter .....



a. increases.
b. decreases.
c. doesn't change.
d. equals the electromotive force of the battery.

2. All the following elements substitute hydrogen of dilute acid in ordinary conditions except .....

a. Zn b. Fe c. Au d. Al

3. Radioactivity phenomenon is discovered by scientist .....

a. Ampere. b. Mendel. c. Ohm. d. Becqueral.

4. ..... hormone stimulates the release of glucose sugar from liver cells.

a. Estrogin b. Insulin c. Glucagone d. Calcitonin

5. From dominant traits in the human body is .....

a. wide eye. b. presence of freckles. c. smooth hair. d. absence of dimples.

B Compare between the following :

1.

Point of comparison	Testosterone hormone	Progesterone hormone
Importance		

2.

Point of comparison	Alternating current	Direct current
The source		

C You have three dry cells, the electromotive force for each one is 1.5 volt. Explain by drawing how to connect them to get a battery its electromotive force equals :

1. 1.5 volt
2. 3 volt
3. 4.5 volt

Question 3

A Complete the following :

1. $2\,NaNO_3 \xrightarrow{\Delta}$ ..... $+ O_2\uparrow$
2. ..... hormone regulates the rate of speed of growth of muscles and bones in the body.
3. The reaction between an acid and an alkali to form salt and water is known as ..... reaction.
4. Mendel's second law is known as the law of .....
5. In the following reaction : $Cl_2 + 2e^- \longrightarrow 2Cl^-$
   chlorine is considered as ..... agent.

B What happens in the following cases ...?

1. Lack of iodine salts in the water and food of human.
2. Putting a piece of sweet potato in a beaker containing a solution of hydrogen peroxide.
3. Touching of two charged electric conductors A and B where the electric potential of A is less than the electric potential of B.

C Explain on genetic bases :

Crossing between a pea plant with white flowers (rr) with another pea plant with red flowers (RR), showing :

(parents – gametes – first generation – second generation)

Question 4

A Correct the underlined words :

1. When adding silver nitrate solution to sodium chloride solution, a **red** precipitate of silver chloride is formed.
2. Nitrogen pentoxide gas decomposes into nitrogen dioxide gas and **nitrogen** gas.
3. The hormones in the human body are secreted by special organs called **duct** glands.
4. The measuring unit of absorbed radiation is **Newton**.
5. The genes control the appearance of hereditary traits of the living organism by producing **vitamins**.

B Give reasons for the following :

1. When heating of green copper carbonate, a black substance is formed.
2. The reactions of ionic compounds are faster than the reactions of covalent compounds.

3. Mendel removed the stamens from the flowers of pea plant before their anthers become mature when doing his experiments.

C Calculate the quantity of electricity passing through a conductor its resistance is 3 ohm for one minute if the potential difference between its terminals is 6 volt.

27 Matrouh Governorate

Answer the following questions :

Question 1

A Choose the correct answer :

1. The thermal decomposition for copper sulphate gives copper oxide and .....
   a. sulpher dioxide. b. sulpher trioxide. c. oxygen. d. sulpher.
2. In the Mendel's second law, the alternative traits are inherited .....
   a. dependently. b. independently. c. interconnected. d. collectively.
3. When sodium atom loses an electron from its outermost energy level it becomes .....
   a. oxidized only. b. reducing agent only.
   c. oxidized and reducing agent. d. reduced.
4. The scientist who discovered radioactivity phenomenon was .....
   a. Ohm. b. Ampere. c. Becquerel. d. Mendel.
5. The ohmmeter is used to measure the .....
   a. electric potential. b. current intensity.
   c. quantity of electricity. d. electric resistance.

B Give reasons for for each of the following :

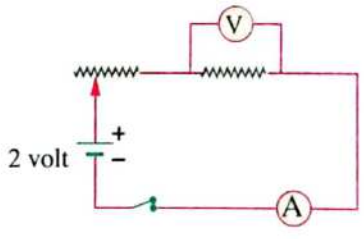
1. Although aluminium is more active than zinc, it takes more time than zinc to react with dilute hydrochloric acid.
2. It is preferred to use alternating current more than direct current.
3. Some elements are called radioactive elements.

C In the opposite figure :

If the quantity of electricity that passes through the electric circuit through 60 seconds is 30 coulomb.

Calculate :

1. The reading of ammeter (A)
2. The resistance of the wire (R).



Question 2

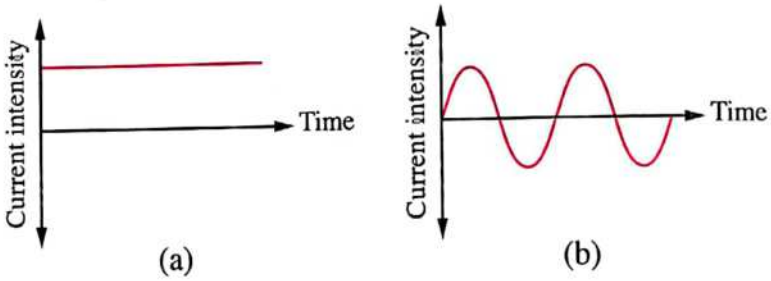
A Complete the following statements :

1. Sodium metal reacts with water producing sodium hydroxide and ..... gas evolves.
2. Every gene gives a special ..... which is responsible for occurrence of a chemical reaction.
3. The reactions of ionic compounds are ..... than that of the covalent compounds.
4. The traits that are not transmitted from one generation to another are called ..... traits.
5. $2N_2O_5 \longrightarrow$ ..... $+ O_2$

B Mention the importance of each of the following :

1. The variable resistance (the sliding rheostat).
2. Nuclear energy in the industrial field.
3. Oxidase enzyme in potato.

C Look at the following figures :



(a) (b)

1. What is the type of the electric current represent by each graph ?
2. What is the name of the source that generates the current of each graph ?

Question 3

A Write the scientific term of each of the following statements :

1. The reaction between an acid and alkali to give salt and water.
2. The resistance of a conductor which allows passing of an electric current intensity of one ampere when the potential difference across its terminals is one volt.
3. Formed chemically form nucleic acid DNA and protein.
4. An arrangement of the metallic elements in a descending order according to their chemical activity.
5. Chemical substance organizes the most biological reactions inside living organisms.

B Compare between each of the following :

1. Physical effects and genetic effects (by giving an example).
2. Addition of hydrochloric acid to zinc and adding hydrochloric acid to copper.

(by chemical equations only)

C If a black male mouse (BB) is crossed with a brown female mouse (bb) mention the colours and ratios of the resulting offspring in the first generation.
Illustrate on hereditary bases.

Question 4

A Rewrite the following statements after correcting the underlined words :

1. On heating copper hydroxide, we obtain **copper and hydrogen**.
2. Mendel choose **ten** hereditary traits in the pea plant to perform his experiment.
3. The two scientists **Badel and Tatum** made a model for DNA molecule.
4. By using 3 gm of catalyst in an experiment its mass after finishing the reaction is **less than** gm.
5. The **chemical** energy can be converted to electrical energy by using dynamo.

B What happened in the following cases ...?

1. Increasing the concentration of reactants. (According to the speed of chemical reaction)
2. Adding silver nitrate solution to sodium chloride solution. (by chemical equation only)
3. The colour of red mercuric oxide when it is heated.

C You have four similar cells the electromotive force of each 1.5 volt.
Explain by using diagrams how can connect them to obtain a battery of e.m.f of :

1. 1.5 volt.
2. 3 volt.

Guide Answers of Final Examinations 2021

1 Cairo Governorate

1

(A) 1. salt 2. dominant
3. Pituitary 4. $FeCl_2 + H_2\uparrow$
5. segregation of factors.

(B) 1. It is the condition (state) of an electric conductor that shows the transfer of the electricity from or to it when it is connected to another conductor.

2. It is the arrangement of metals in a descending order according to the degree of their chemical activity.

(C) Time = 4 × 60 = 240 sec.

$$\text{Current intensity (I)} = \frac{\text{quantity of charge (q)}}{\text{time (t)}}$$

$$= \frac{2400}{240} = 10 \text{ amp.}$$

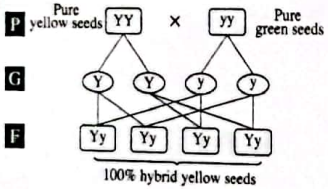
2

(A) 1. b 2. c 3. d 4. a 5. b

(B) 1. Because by increasing the temperature, the number of probable collisions between reactants molecules increases, so the speed of reaction increases.

2. Because : - it can be transferred for long distances through wires.
- it can be changed into a direct current.

(C)



3

(A) 1. Catalysts. 2. Chromosome
3. Sievert. 4. Endocrine glands.
5. Reduction process. 6. Dominant trait.

(B) 1. A white precipitate of silver chloride is formed

$$NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$$

2. Pancreas responses by secreting glucagon hormone to raise the percentage of glucose sugar in blood.

(C) a. Cells connected in series :

$E_{(battery)} = n \times E_1 = 1.5 \times 3 = 4.5$ volt.

b. Cells connected in parallel :

$E_{(battery)} = E_1 = 1.5$ volt.

4

(A) 1. Voltmeter is a device used to measure the electromotive force.

2. The increase in secretion of thyroxin hormone leads to exophthalmic goiter disease.

3. The radioactive element nuclei contain a number of neutrons more than the number required for stability.

4. Acquired traits that aren't transmitted from one generation to another.

5. Hybrid individual carries one dominant gene and other is recessive

6. Oxidizing agent is the substance which gains an electron or more during a chemical reaction.

(B) 1. $Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$
(Blue colour) (colourless) (Red ppt.)

2. $2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + Heat$

(C) *Look at the main book on page (133)*

2 Giza Governorate

1

(A) 1. Joule 2. recessive 3. DNA 4. 9

(B) 1. (✓) 2. (✗) 3. (✓) 4. (✓)

(C) This means that the potential difference between the two poles of the electric cell when the circuit is open is 1.5 volt.

2

(A) 1. Negative catalyst
2. Radioactivity phenomenon (Natural radioactivity)
3. Series connection
4. Reduction process

(B) 1. a 2. a 3. c 4. c

(C) No electric current will pass through them, because there is no potential difference between them (potential difference = Zero).

3

(A) 1. adrenalin 2. sievert
3. two testes glands 4. 15

(B) 1. 75% 2. AgCl
3. stamens 4. increasing the temperature.

(C) The blue colour of copper sulphate disappears and a red precipitate of copper is formed.

$$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$$

4

(A) 1. c 2. d 3. a 4. b

(B) 1. Child No. [1] 2. 220
3. Ohmmeter
4. 50% smooth hybrid seeds : 50% wrinkled seeds.

(C) Due to the decomposition of red mercuric oxide by heating into mercury (silvery precipitate) and oxygen gas evolves.

$$2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$$

3 Alex. Governorate

1

(A) 1. nuclei - radioactivity phenomenon (natural radioactivity)
2. Concentration 3. hereditary factors.

(B) 1. An effervescence occurs due to evolving of bubbles of carbon dioxide gas.

$$Na_2CO_3 + 2HCl \xrightarrow{dil.} 2NaCl + H_2O + CO_2\uparrow$$

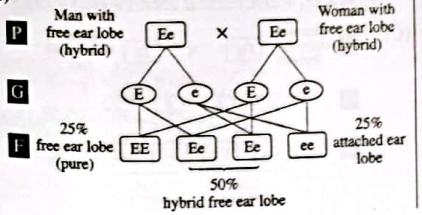
2. This will lead to the infection with the diabetes diseases.

(C) 1. b 2. d 3. e 4. c

2

(A) 1. Chemical activity series
2. Progesterone
3. Potential difference across a conductor.
4. Covalent compounds.

(B)



(C) 1. $R = \frac{V}{I} = \frac{6}{2} = 3$ ohm.

2. $\because I = \frac{q}{t}$

$\therefore q = I \times t = 2 \times 30 = 60$ coulomb

3

(A) 1. a 2. c 3. d 4. b

(B) 1. (X) : $NaNO_3$ / (Y) : O_2

2. Type of reaction.
- in first equation : Double substitution reaction.
- in second equations : Thermal decomposition reaction.

(C) 1. Adrenal gland

2. Adrenalin hormone : Stimulates body's organs to respond to emergencies.

4

(A) 1. Kinetic 2. metal oxide
3. nucleus 4. natural

(B) 1. Because the low temperature in the fridge slows down the speed of the chemical reactions done by bacteria which cause the rot of food.

2. To obtain a battery, the e.m.f of it is low.

(C) 1. It is the substance which takes oxygen away or gives hydrogen during a chemical reaction. or it is the substance which loses one electron or more during a chemical reaction.

2. They are the traits that aren't transmitted from one generation to another.

4 El-Qalyoubia Governorate

1

(A) 1. d 2. c 3. a 4. a

(B) 1. electron 2. adrenalin
3. fast 4. thyroxin

(C) 6 volt

2

(A) 1. natural 2. mercuric oxide
3. coulomb 4. oxygen

(B) 1. (✗) 2. (✓) 3. (✗) 4. (✗)

(C) A direct electric current is produced.

3

(A) 1. (1) pituitary gland (2) pancreas
(3) Stimulates the release of glucose sugar from the liver
(4) progesterone
2. (1) 3 volt (2) 4.5 volt
(B) 1. e 2. f 3. g 4. a
(C) The blue colour of copper sulphate disappears and a red precipitate of copper is formed.

$$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$$

4

(A) 1. The speed of chemical reaction
2. Isotopes
3. Chemical activity series
4. Electric current intensity
(B) 1. a. the chromosome b. DNA
c. the hereditary (genetic) traits d. gene
2. (B) / R = $\frac{V}{I}$
(C) • The produced gas : H_2

$$\bullet\ Zn + 2HCl \xrightarrow{dil.} ZnCl_2 + H_2\uparrow$$

5 Menofia Governorate

1

(A) 1. Electric potential of a conductor.
2. Genes
3. The coulomb
4. Hybrid individual.
(B) First : a. Sodium nitrate ($NaNO_3$)
b. white colour.
c. Sodium nitrite ($NaNO_2$)
d. yellowish white colour.
Second : 1. Pancreas gland
2. Insulin
3. Glucagon
(C) w = 200 joule, t = 2 sec., v = 20 volt, I = ?

$$q = \frac{w}{v} = \frac{200}{20} = 10 \text{ coulomb}$$

$$\therefore I = \frac{q}{t} = \frac{10}{2} = 5 \text{ amp.}$$

2

(A) 1. e 2. d 3. a 4. b
(B) 1. independent assortment of hereditary factors.
2. less than
3. more than
4. acquired traits
(C) 1. decreases. 2. increases. 3. doesn't change

3

(A) 1. adrenal 2. chemical
3. Dwarfism 4. remains constant
(B) First : a. Oxidation process
b. Simple substitution reaction.
Second : [1] Yy [2] Yy [3] yy [4] yy
(C) 1. Because the oxidase enzyme in sweat potato acts as a catalyst which increases the rate of decomposition of hydrogen peroxide into water and oxygen gas.
2. Due to the presence of a layer of aluminium oxide (Al_2O_3) on aluminium surface, which takes time to separate from aluminium, which delays the starting of occurrence of the reaction.

4

(A) 1. (✗) 2. (✓) 3. (✓) 4. (✗)
(B) 1. d 2. d 3. c 4. c
(C) 1. A. $CuCO_3$ B. CuO X.Cu
2. Reduction process.

6 Dakahlia Governorate

1

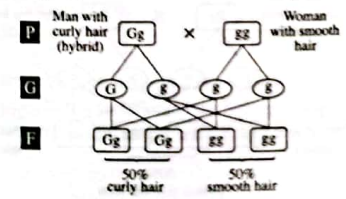
(A) 1. d 2. b 3. b 4. d
(B) 1. $NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$

$$2.\ H_2 + CuO \xrightarrow{\Delta} H_2O + Cu$$

$$3.\ 2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + Heat$$

$$4.\ Na_2CO_3 + 2HCl \xrightarrow{dil.} 2NaCl + H_2O + CO_2\uparrow$$

(C)



2

(A) 1. Bone marrow.
2. a catalyst
3. the ability to roll the tongue
4. glycogen in the liver cells
(B) 1. B 2. C 3. A
4. Theremal decomposition reaction.
(C) 1. The electric current intensity passing through a conductor is directly proportional to the potential difference across it at a constant temperature.
2. The change in the concentration of the reactants and the resultants in a unit time.

3

(A) 1. increasing the number of probable collisions.
2. blood
3. loses one electron
4. rheostat.
(B) 1. Neutralization reaction.
2. Natural radioactivity.
3. Electric potential of a conductor.
4. Chromosome.
(C) *Look at the main book on page (133).*

4

(A) 1. Because the reactions of ionic compounds take place between ions
2. Because : - It can be transferred for long distances through wires.
- It can be changed into a direct current.
3. To be sure of the purity of the trait.
4. Due to the decrease in the secretion of the growth hormone at childhood.
(B) 1. close the key.

$$2.\ I = \frac{q}{t} = \frac{10}{20} = 0.5 \text{ ampere.}$$

3. 1.5 volt

$$4.\ R = \frac{V}{I} = \frac{1.5}{0.5} = 3 \text{ ohm.}$$

(C) 1. N_2O_5
2. HCl

7 Sharkia Governorate

1

(A) 1. Electric potential of a conductor.
2. The chromosome.
3. Potential difference across a conductor.
4. Hybrid individual
(B) 1. $FeCl_2$
2. Controls the level of calcium in blood.
3. $H_2\uparrow$
4. progesterone
(C) $\because I = \frac{q}{t}$ $\therefore q = I \times t = 5 \times 10 = 50$ coulomb
$\because q = \frac{w}{v}$ $\therefore v = \frac{w}{q} = \frac{200}{50} = 4$ volt

2

(A) 1. d 2. c 3. a 4. a
(B) 1. (✓) 2. (✗) 3. (✗) 4. (✗)
(C) *Look at the main book on page (100).*

3

(A) 1. direct 2. thyroxin 3. 20 4. growth
(B) 1. d 2. d 3. a 4. c
(C) 1. $Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$

$$2.\ CuSO_4 \xrightarrow{\Delta} CuO + SO_3\uparrow$$

$$H_2 + CuO \xrightarrow{\Delta} H_2O + Cu\downarrow$$

4

(A) 1. ions
2. length of the conductor (metallic wire coil)
3. oxygen 4. work
(B) 1. Ohmmeter 2. stigmas
3. 40 4. enzymes
(C) 1. The reason of using manganese dioxide : To act as a catalyst which increases the speed of decomposition of hydrogen peroxide into water and oxygen gas.
2. Remains constant.

8 El-Gharbia Governorate

1

(A) 1. dominant 2. voltmeter
3. gametes 4. genetic

(B) 1. The speed of chemical reaction
2. Testosterone hormone
3. Chemical activity Series
4. Endocrine glands

R = 2200 Ohm. $t = 60 \times 2 = 120$ sec.,

V = 220 volt

$I = \frac{V}{R} = \frac{220}{2200} = 0.1$ ampere

$\because I = \frac{q}{t}$

$\therefore q = I \times t = 0.1 \times 120 = 12$ coulomb

2

(A) 1. b 2. c 3. a 4. b

(B) 1. (✗) 2. (✓) 3. (✓) 4. (✗)

(C) 1. The electromotive force of the cells connected in series :

$E_{battery} = n \times E_1$
$= 3 \times 2 = 6$ volt

2. The electromotive force of the cells connected in parallel :

$E_{battery} = E_1$
$= 2$ volt

3

(A) 1. brain 2. series 3. insulin 4. electrons

(B) 1. They are responsible for appearing the individual's hereditary traits.
2. It increases the speed of decomposition of hydrogen peroxidase.
3. ***Look at the main book on page (209).***
4. It helps in the treatment of harmful gases emitted from the car engine.

(C) ***Look at the main book on page (29).***

4

(A) 1. d 2. c 3. a 4. f

(B) 1. No electric current will pass through them, because there is no potential difference between them (potential difference = zero).
2. Cross pollination occurs in these flowers.
3. The electrons in the outer level become free.
4. The reaction which results in a protein showing a specific hereditary trait will not occur.

(C) 1. $NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$ (white ppt)

2. $Na_2CO_3 + 2HCl \xrightarrow{dil.} 2NaCl + H_2O + CO_2\uparrow$

9 Damietta Governorate

1

(A) 1. The coulomb 2. The simple cell (dry cell)
3. Dominant trait 4. Genes

(B) 1. aprecipitate 2. thyroxin
3. iron rust 4. glucagon

(C) 1. e.m.f. = 2 + 2 = 4 volt

2. $I = \frac{V}{R} = \frac{4}{10} = 0.4$ ampere

2

(A) 1. b 2. c 3. a 4. b

(B) 1. segregation of factors.
2. oxidized and reducing agent
3. 50% hybrid dominant and 50% recessive
4. Sulphur trioxide

(C) 1. No electric current will pass through them, because there is no potential difference between them (potential difference = zero)
2. This may lead to the damage of bone marrow, spleen, digestive system and central nervous system.

3

(A) 1. (✗) 2. (✓) 3. (✓) 4. (✗)

(B) 1. c 2. d 3. b 4. e

(C) 1. $2NaNO_3 \xrightarrow{\Delta} 2NaNO_2 + O_2\uparrow$

2. (1) $2NaNO_3$ (2) O_2 (3) $2NaNO_2$

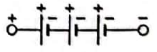
4

(A) 1. c 2. a 3. b 4. a

(B) 1. (a) The trait of each pair is inherited independently and all individuals of the first generation appear carrying the dominant traits only and in the second generation, the dominant traits and the recessive trait appear at a ratio of 3 : 1

(b) A silvery precipitate of mercury is formed and oxygen gas evolves

$2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$

2. 

Type of connection : Series connection

(C) 1. Because aluminium comes before silver in the chemical activity series, so it substitutes silver in silver nitrate solution which leads to eroding of aluminium containers.
2. Because the low temperature in the fridge slows down the speed of the chemical reactions done by bacteria which cause the rot of food.

10 Kafr El-Sheikh Governorate

1

(A) 1. black 2. genes 3. Thyroid 4. $H_2\uparrow$

(B) 1. Due to the presence of a layer of aluminium oxide (Al_2O_3) on aluminium surface, which takes time to separate from aluminium, which delays the starting of occurrence of the reaction.
2. Because the low temperature in the fridge slows down the speed of the chemical reactions done by bacteria which cause the rot of food.
3. ***Look at the main book on page (188)***
4. Because the reaction of ionic compounds takes place between ions.

(C) He discovered the emission of unseen rays from the uranium element that has the ability to penetrate solid objects.

2

(A) 1. d 2. a 3. b 4. d

(B) 1. Mercuric oxide 2. The dry cell
3. Treat and diagnose diseases like cancer (in medical field)
4. Curly hair

(C) Pituitary gland / It secretes hormones that regulate the activities of most of other endocrine glands.

3

(A) 1. Sievert 2. Catalyst
3. Ammeter 4. Acquired traits

(B) 1. It is used in lighting houses and in operating of electric appliances.
2. It is used for measuring the electromotive force of the battery.
3. It is considered as one of the most important safety means in cars at emergencies.
4. it secretes adrenalin hormone that stimulates body's organs to respond to emergencies.

(C) $NaOH + HCl \xrightarrow{dil.} NaCl + H_2O$

4

(A) 1. male 2. red
3. reactants 4. kinetic

(B) 1. (a) Alternating current (b) Direct current
2. (a)
3. (b)

(C) Pancreas responses by secreting glucagon hormone to raise the percentage of glucose sugar in blood.

11 Al-Behiera Governorate

1

(A) 1. d 2. c 3. b 4. a

(B) 1. It helps in the treatment of harmful gases emitted from the car engine.
2. protection from radiation pollution.
3. It used in lighting houses and in operating of electric appliances.
4. They are responsible for appearing the individual's hereditary traits.

(C) $\because V = \frac{W}{q} = \frac{20}{40} = 0.5$ volt

$\therefore I = \frac{V}{R} = \frac{0.5}{10} = 0.05$ ampere.

2

(A) 1. It chemically consists of a nucleic acid called DNA combined with protein.
2. It is the electric current intensity passing through a circuit when a charge of one coulomb passes through a given cross-section in one second.
3. It is an electric current which has a constant intensity and flows in one direction in the electric circuits.
4. A chemical process where the atom loses an electron or more.

(B) 1. The electric current will flow from the conductor that has the higher electric potential to the other.
2. pancreas responses by secreting insulin hormone to reduce the percentage of glucose sugar in blood.
3. An ignition occurs accompanied by a strong pop sound

$2Na + H_2O \longrightarrow 2NaOH + H_2\uparrow + Heat$

4. The trait of each pair is inherited independently and all individuals of the first generation appear carrying the dominant traits only and in the second generation, the dominant trait and the recessive trait appear at ratio of 3 : 1

(C) The total e.m.f = 1.5 + (1.5 × 3) = 6 volt

$\therefore I = \frac{V}{R} = \frac{6}{3} = 2$ ampere

3

(A) 1. Human genome 2. The electric resistance
3. Acquired traits 4. Enzymes

(B) 1. ions 2. coulomb
3. sinuous 4. zero

(C) *Look at the main book on page (63).*

4

(A) 1. $2NaNO_2 + O_2\uparrow$ 2. calcitonin
3. $MgSO_4 + Cu\downarrow$ 4. increases

(B) 1. Because the gene of the ability to roll the tongue dominates over the gene of the non-ability to roll the tongue if they are both present together in an individual.

2. Because the resistance of electric conductor is directly proportional to its length.

3. Due to the decomposition of red mercuric oxide by heat into mercury (silver precipitate) and oxygen gas evolves

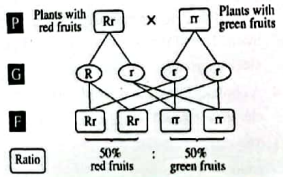
$2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$

(silver ppt.)

4. Due to decomposition of blue copper hydroxide by heating into copper oxide (black) and water.

$Cu(OH)_2 \xrightarrow{\Delta} CuO + H_2O\uparrow$

(C)



12 Ismailia Governorate

1

(A) 1. ammeter / the potential difference across two ends of a conductor
2. direct / alternating
3. two factors / gametes.
4. dominant / recessive.

(B) 1. a. (2). B b. (3). A
2. a. (2). C b. (3). B

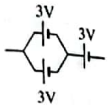
(C) $I = \frac{V}{R} = \frac{18}{9} = 2$ ampere

2

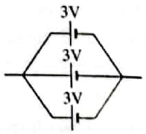
(A) 1. negative catalytic 2. $O_2\uparrow$
3. the potential difference between
4. Sievert

(B) 1. colour of the substance in :
– Tube (A) : silver.
– Tube (B) : Black.
2. *Look at the main book on page (29).*
3. The hereditary traits : transmitted from one generation to another.
– Acquired traits : can't transmitted from one generation to another.
4. – Mendel's first law : law of segregation of factors.
– Mendel's second law : law of independent assortment of factors.

(C) (1) to get e.m.f = 6 volt



(2) To get e.m.f = 3 volt



3

(A) 1. Electric current intensity
2. Electrochemical cells
3. Hormone
4. Diabetes

(B) 1. a. Tube (3) b. Double substitution reaction
2. a. child No. (1) b. 25%
3. The reaction in case of iron filings ends in a short time than that in case of iron wire because the speed of chemical reaction increases by increasing the surface area of the reactants exposed to the reaction with humid air.

4

(A) 1. a 2. c 3. c 4. d

(B) (1) a. 1 b. 2
(2) a. Enzyme b. protein

(C) 1. Because the low temperature in the fridge slows down the speed of the chemical reactions done by bacteria which cause the rot of food.

2. Because aluminium comes before silver in the chemical activity series, so it substitutes silver in silver nitrate solution which leads to eroding of aluminium containers.

13 Suez Governorate

1

(A) 1. hydrogen
2. natural sources / artificial sources
3. dominant trait.

(B) 1. a. A black substance of copper oxide is formed and sulphur trioxide gas evolves.

$CuSO_4 \xrightarrow{\Delta} CuO + SO_3\uparrow$

b. The recessive trait appears.

2. a. It consists of small parts called genes present on the chromosomes and they are responsible for appearing the individual's hereditary traits

b. They secrete the hormones in the human body.

(C) (1) The current intensity (I) $= \frac{q}{t} = \frac{600}{(5 \times 60)} = 2$ amp.

(2) The potential difference between the two points (V) $= \frac{w}{q} = \frac{3600}{600} = 6$ volt

2

(A) 1. oxygen 2. hybrid
3. glucagon 4. faster

(B) (1) 1. Due to formation of silver chloride salt which doesn't dissolve in water

$NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$

2. *Look at the main book on page (188).*

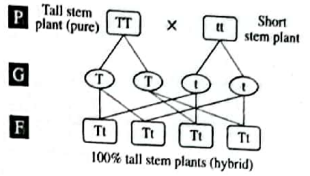
(2) 1. b 2. c

(C) 1. b
2. No reaction occurs.

3

(A) 1. c 2. b 3. a 4. a

(B) (1)



(2) 1. Cu 2. $2NaCl / CO_2\uparrow$

(C) 1. It is a substance which changes the rate of the chemical reaction without changing or being used up.

2. It is the spontaneous decay of the atoms' nuclei of radioactive elements that are present in nature in an attempt to achieve a more stable composition.

4

(A) 1. Reduction process 2. Electric current
3. Neutralization reaction 4. Thyroid gland

(B) 1. *Look at the main book on pages (135 & 136).*
2. *Look at the main book on page (186).*

(C) 1. Fixed resistance.
2. $R = \frac{V}{I} = \frac{6}{2} = 3$ ohm.

14 Port Said Governorate

(A) 1. The electromotive force of the battery / volt
2. DNA / protein.
3. kinetic / electric
4. short / growth.

(B) 1. - The reaction of ionic compound are fast.
- Most of the reaction of cavalent compounds are slow

2.

	Dwarfism	Exophthalmic goiter
Reason	Decrease in secretion of the growth hormone at the childhood.	increase in secretion of the thyroxin hormone with large amounts.

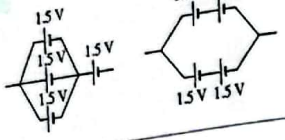
(C) V = R × I = 22 × 10 = 220 volt

2

(A) 1. The speed of chemical reaction.
2. Simple substitution reaction.
3. Electric current.
4. Radioactivity phenomenon.

(B) 1. (✗) 2. (✗) 3. (✓) 4. (✓)

(C)



3

(A) 1. c 2. b 3. b 4. c

(B) 1. They are the traits that aren't transmitted from one generation to another.

2. They are cells by which the hereditary traits are transmitted from parents to their offspring.

3. It is a reaction between an acid and an alkali to form salt and water.

4. It chemical process which causes the decrease in the oxygen percentage or the increase in the hydrogen percentage in a substance.

Or

Chemical process where the atom gains an electron or more.

(C) $CuSO_4 \xrightarrow{\Delta} CuO + SO_3\uparrow$

$H_2 + CuO \xrightarrow{\Delta} H_2O + Cu$

4

(A) 1. c 2. d 3. e 4. a

(B) 1. volt. 2. one

3. segregation of factors. 4. self

(C) By using a piece of zinc :

– copper sulphate : it reacts with zinc forming zinc sulphate and a red ppt. of copper.

– Magnesium sulphate : No reaction occurs.

15 Fayoum Governorate

1

(A) 1. ammeter – voltmeter 2. natural – artificial

3. recessive – dominant 4. Genetics – parents

(B) 1. Neutralization 2. metal oxide

3. Ductless 4. The iodine

(C) $I = \frac{V}{R} = \frac{220}{1000} = 0.22$ ampere

$\because t = 30 \times 60 = 1800$ sec.

$\therefore q = I \times t = 0.22 \times 1800 = 396$ coulomb

2

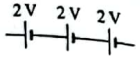
(A) 1. b 2. c 3. a 4. d

(B) 1. Reducing agent.

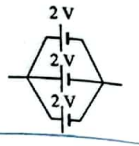
2. The speed of chemical reaction.

3. pea plant. 4. chromosome.

(C) 1. e.m.f = 6 volt



2. e.m.f = 2 volt



3

(A)

No	odd word	The rest
1.	Salivary glands	Endocrine glands
2.	Thyroid gland	Related to pituitary gland
3.	Pressure	Physical properties of the electric current
4.	Sodium	Some radioactive elements

(B) 1. c 2. d 3. b 4. a

(C) 1. $NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$

2. $CuSO_4 \xrightarrow{\Delta} CuO + SO_3\uparrow$

4

(A) 1. The intensity of the electric current

2. The radioactive materials are used in nuclear bombs

3. Rusting of iron 4. Fireworks

(B) 1. (✓) 2. (✗) ... is sievert

3. (✓) 4. (✓)

(C) 1. The glowing of the burning match stick increases due to the evolving of oxygen gas.

2. The speed of chemical reaction increases.

16 Beni-Suef Governorate

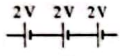
1

(A) 1. second 2. nuclear binding

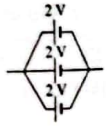
3. gamets 4. ammeter

(B) 1. (✗) 2. (✓) 3. (✗) 4. (✓)

(C) 1. e.m.f = $n \times E_1 = 3 \times 2 = 6$ volt



2. e.m.f = $E_1 = 2$ volt



2

(A) 1. c 2. b 3. c 4. a

(B) 1. recessive trait 2. hydrogen gas

3. dominant trait 4. oxygen gas

(C) V = R × I

= 20 × 4 = 80 volt

3

(A) 1. The electric resistance.

2. Alternating electric current.

3. Hormone.

4. pituitary gland.

(B) 1. d 2. e 3. c 4. a

(C) $NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$

4

(A) 1. not equal to 2. chemical

3. increase 4. e.m.f.

(B) 1. c 2. b 3. d 4. c

(C) Because the reactions of ionic compounds take place between ions, while the reactions of covalent compounds take place between molecules.

17 El-Minia Governorate

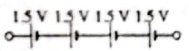
1

(A) 1. gametes 2. radiations

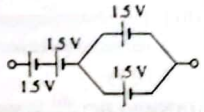
3. Dynamo 4. H_2O

(B) 1. (✓) 2. (✗) 3. (✗) 4. (✓)

(C) - Total e.m.f = 6 volt



- Total e.m.f = 4.5 volt



2

(A) 1. The speed of chemical reaction.

2. Catalytic converter.

3. The ampere.

4. The ohm.

(B) 1. pure

2. law of independent assortment of hereditary factors

3. increasing the surface area of the reactants exposed to the reaction

4. need millions of years

(C) $V = \frac{w}{q} = \frac{3330}{30} = 111$ volt.

3

(A) 1. It is used to control the current intensity and potential difference in the electric circuit.

2. Treat and diagnose diseases like cancer in medical field.

3. It stimulates body's organs to respond to emergencies.

4. It stimulates the release of glucose sugar from the liver.

(B) 1. d 2. c 3. b 4. a

(C) Because the reactions of ionic compounds take place between ions, while the reactions of covalent compounds take place between molecules.

4

(A) 1. A silvery precipitate of mercury is formed and oxygen gas evolves.

$2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$

2. The electric current will flow from the conductor that has higher electric potential to the other.

3. This will lead to the damage of :

- Bone marrow • spleen
- Digestive system • Central nervous system.

4. An ignition occurs accompanied by a strong pop sound.

$2Na + 2H_2O \longrightarrow NaOH + H_2\uparrow + Heat$

(B) 1. b 2. d 3. a 4. e

(C) (a) represents direct electric current / (b)

18 Assiut Governorate

1

(A) 1. b 2. a 3. a 4. c 5. c

(B) 1. No reaction occurs

2. This will lead to the damage of :

- bone marrow • spleen
- digestive system • central nervous system

3. The rate of chemical reaction increases.

(C) 1. $2Na + Cl_2 \longrightarrow 2\,Na^+Cl^-$

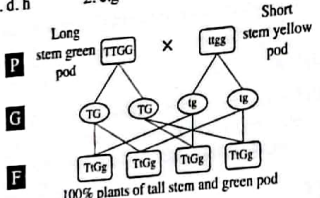
2. oxidizing agent : chlorine
Because it gains one electron during chemical reaction.
Reducing agent : sodium
Because it loses one electron during chemical reaction.

2

(A) 1. segregation of factors. 2. slower
3. treat and diagnose diseases like cancer.
4. joule. 5. zero

(B) 1. d. h 2. c.g 3. a. i

(C)



3

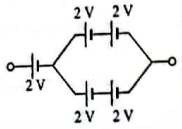
(A) 1. Catalyst. 2. Genetics.
3. The electric resistance. 4. Genes.
5. Neutralization reaction.

(B) 1. $2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + Heat$

2. $2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$

3. $Na_2CO_3 + 2HCl \xrightarrow{dil.} 2NaCl + H_2O + CO_2\uparrow$

(C) By connecting 4 cells in parallel + one cell connected in series.



4

(A) 1. (✗) ... to their chemical activity.
2. (✗) ... stamens from ...
3. (✓)
4. (✗) The iodine ...

(B) 1. Because aluminium comes before silver in the chemical activity series, so it substitutes silver in silver nitrate solution which leads to eroding of aluminium containers.
2. To control the current intensity and potential difference in the electric circuits.
3. Due to the presence of nuclear binding forces that are originated inside the nucleus.

(C) 1. when two pure different individuals bearing two pairs or more of alternative (contrasting) traits are crossed, the trait of each pair is inherited independ gently of the others and appears in the second generation at a ratio of 3 (dominant trait) : 1 (recessive trait).
2. It is a chemical substance (or a chemical message) that controls and organizes most of the vital activities and functions in the bodies of living organisms.
3. It is the breaking up of bonds in molecules of the reactants and formation of new bonds in the molecules of resultants (products) from the reaction.

19 Sohag Governorate

1

(A) 1. ammeter 2. electric resistance.
3. Genes 4. Acquired

(B) 1. c 2. a 3. d 4. b

(C) $E_{battery} = E_1 = 2$ volt

2

(A) 1. The chemical activity series.
2. The speed of chemical reaction
3. Ohm's law.
4. Radioactivity phenomenon.

(B) 1. b 2. c 3. c 4. b

(C) *Look at the main book on page (135).*

3

(A) 1. (✓) 2. (✗) (electric cell)
3. (✓) 4. (✗) .... insulin ....

(B) 1. The substitution reaction.
2. Reduction process.
3. (a) Yy (b) yy

(C) $NaCl + HCl \xrightarrow{dil.} NaCl + H_2O$

4

(A) 1. natural 2. parallel 3. metal oxide 4. white

(B) 1. ohm 2. Sivert
3. the principle of complete dominance.
4. Hybrid

(C) Because the reactions of covalent compounds take place between molecules.

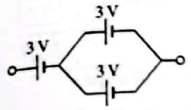
20 Qena Governorate

1

(A) 1. segregation of factors. 2. directly
3. protein. 4. nuclear

(B) 1. (✓) 2. (✗) 3. (✓) 4. (✓)

(C)



2

(A) 1. The chemical reaction. 2. The electric resistance.
3. Catalyst. 4. The ammeter.

(B) 1. Chemical activity. 2. acquired
3. Mendel 4. N_2O_5

(C) Because the low temperature in the fridge slows down the speed of chemical reactions done by bacteria which cause the rot of food.

3

(A) 1. a. the potential difference.
b. electromotive force (e.m.f.)
2. a. Adrenal b. adrenalin

(B) 1. Iron 2. Presence of freckles
3. Current produced from electric generators
4. Genes are present in the cytoplasm.

(C) – Oxidizing agent : CuO
– reducing agent : H_2

4

(A) 1. d 2. a 3. c 4. b

(B) 1. d 2. b 3. b 4. a

(C) $2NaNO_3 \xrightarrow{\Delta} 2NaNO_2 + O_2\uparrow$

21 Luxor Governorate

1

(A) 1. industrial 2. dominant 3. ohmmeter
4. law of segregation of factors

(B) 1. Formation of sodium chloride and water
$NaOH + HCl \xrightarrow{dil.} NaCl + H_2O$
2. The body stops growing, so the person becomes a dwarf.
3. The catalyst decreases the speed of chemical reaction.
4. It stimulates the storage of glucose in the liver.

(C) • The alternating current results from electron generator.
• The reason :
- it can be transferred for long distances through wires.
- it can be changed into a direct current.

2

(A) 1. c 2. a 3. c 4. b

(B) 1. copper oxide 2. 3 : 1
3. white 4. hybrid

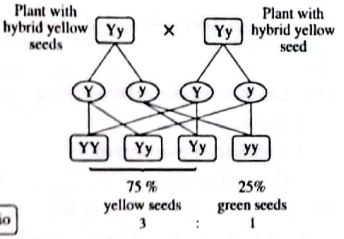
(C) The chemical composition of the hemoglobin changes, so it becomes incapable of carrying oxygen.

3

(A) 1. sievert 2. Endocrine glands
3. The ampere 4. Exophthalmic goiter.

(B) (1) 1. $NaNO_3$ 2. Oxygen (O_2)

(2)

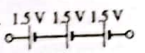


(C) Because the number of gained electrons in reduction process equals the number of lost electrons in oxidation process.

4

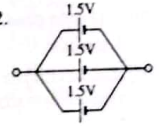
(A) 1. *Look at the main book on page (12).*
2. It is an inflatable bag folded inside the steering wheel in modern cars and they are considered one of the most important safety means in cars at emergencies.
3. Treatment and diagnose diseases like cancer.
4. It is used for measuring the electric current intensity.

(B) 1.

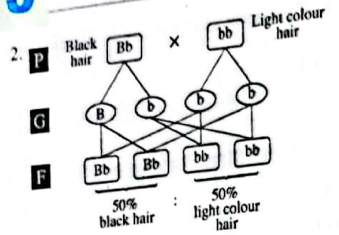


$E_{battery} = n \times E_1$
$= 3 \times 1.5 = 4.5$ V

2.



$E_{battery} = E_1 = 1.5$ V

2. 

(C) Because manganese dioxide acts as a catalyst which increases the speed of decomposition of hydrogen peroxide into water and oxygen gas.

22 Aswan Governorate

1

(A) 1. Electric generator 2. HCl
3. dominant 4. faster

(B) 1. d 2. e 3. c 4. a

(C) A black substance of copper oxide is formed and carbon dioxide gas evolves

$$CuCO_3 \xrightarrow{\Delta} CuO + CO_2\uparrow$$

2

(A) 1. Law of segregation of factors (Mendel's first law).
2. Reduction process.
3. Radioactivity phenomenon.
4. Chemical reaction.

(B) ① Rr ② r ③ RR ④ rr

(C) Total V = 3 + 4 + 3 = 10 volt

$I = \frac{V}{R} = \frac{10}{2} = 5$ ampere

3

(A) 1. d 2. c 3. b 4. d

(B) 1. Silver 2. Barometer 3. Iron 4. Cancer

(C) 1. Hydrogen gas.
2. Simple substitution reaction.

4

(A) 1. nuclear 2. oxidizing agent
3. directly 4. chemical

(B) 1. Thyroid gland. 2. trachea
3. thyroxin 4. exophthalmic goiter

(C) increases the rate of decomposition of hydrogen peroxide as it acts as a catalyst

23 Red Sea Governorate

1

(A) 1. $2Hg - O_2$ 2. Thyroid
3. high – low 4. protein
5. reducing – oxidizing

(B) 1. $2N_2O_5$ 2. O_2 3. $4NO_2$

(C) ∵ $I = \frac{q}{t} = \frac{20}{2} = 10$ ampere
∴ V = R × I = 22 × 10 = 220 volt

2

(A) 1. c 2. d 3. b 4. c
5. a 6. b

(B) *Look at the main book on page (100).*

(C) 1. Because magnesium comes before copper in the chemical activity series, so it replaces copper in copper sulphate solution and copper precipitates as red ppt.

$$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$$

2. To obtain a battery, the e.m.f. of it is high.

3

(A) 1. Oxidation process.
2. Hereditary traits.
3. Neutralization reaction.
4. Quantity of charge (q).
5. Chemical activity series.

(B) 1. (a) Direct electric current.
(b) Alternating electric current.
2. The source of the electric current in :
- (a) : Electrochemical cells such as dry cells and batteries.
- (b) : Electric generators such as dynamoes.

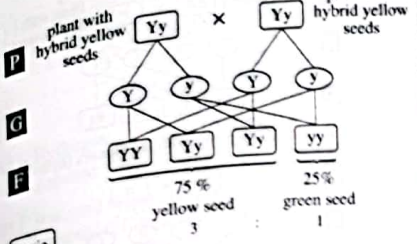
(C) 1. An ignition occurs accompanied by a strong pop sound

$$2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + Heat$$

2. The body stops growing, so the person becomes a dwarf.

4

(A) 1. faster 2. metal oxide 3. directly
4. dominant 5. Henri Becquerel.

(B) 

(C) 1. Treat and diagnose diseases like cancer.
2. It stimulates the storage of glucose sugar from the liver.

24 North Sinai Governorate

1

(A) 1. 6 – 8 2. pea plant. 3. dominant trait.

(B) 1. Endocrine glands. 2. Pituitary gland.
3. Chemical reaction. 4. Negative catalyst.

(C) The illumination of the lamp increases, because the resistance decreases, so the current intensity increases.

2

(A) 1. oxidizing factor.
2. The speed of chemical reaction.
3. alternating electric current – variable.

(B) 1. (✓) 2. (✗) 3. (✗) 4. (✓)

(C) 1. $R = \frac{V}{I} = \frac{8}{2} = 4$ ohm

2. ∵ $I = \frac{q}{t}$
∴ q = I × t = 2 × 60 = 120 coulomb

3

(A) 1. b 2. c 3. d 4. b

(B) 1. $NaCl + H_2O$ 2. faster
3. hereditary 4. chromosome.

(C) - Oxidizing gent : (Y), because it is the substance which gains an electron or more during a chemical reaction.
- Reducing agent : (X), because it is the substance which loses an electron or more during a chemical reaction.

4

(A) 1. metal oxide 2. 100% 3. chemical 4. work

(B) First :
1. Direct electric current.
2. Electric potential of a conductor.
Second :
(a) Yy (b) YY (c) Yy (d) Yy

(C) 1. $2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$

2. $Fe + 2HCl \xrightarrow{dil.} FeCl_2 + H_2\uparrow$

25 South Sinai Governorate

1

(A) 1. Dominant trait. 2. Electrochemical cells.
3. Chromosome. 4. Radiation pollution.

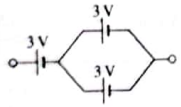
(B) 1. Food becomes rotten due to increasing chemical reaction done by bacteria.
2. The body stops growing, so the person becomes a dwarf.
3. Zinc reacts with dil. HCl immediately and hydrogen gas evolves.
4. This leads to decreasing in secretion of thyroxin hormone and this leads to that the human suffers from simple goiter.

(C) V = R × I = 22 × 10 = 220 volt

2

(A) 1. (✗) 2. (✗) 3. (✓) 4. (✗)

(B) 1. oxidizing factor (agent). 2. Mendel.
3. molecules. 4. gametes.

(C) 

3

(A) 1. c 2. b 3. a 4. b

(B) 1. d 2. c 3. b 4. a

(C) oxygen gas

4

(A) 1. Products concentration. 2. $\frac{Joule}{coulomb}$
3. Copper. 4. Barium.

(B) 1. electric resistance 2. yy
3. potential difference 4. 25 %

(C) $2NaNO_3 \xrightarrow{\Delta} 2NaNO_2 + O_2\uparrow$

26 The New Vally Governorate

1

(A) 1. The coulomb. 2. Acquired traits.
3. Reduction process. 4. Pituitary gland.
5. Radioactivity phenomenon

(B) 1. $Cu(OH)_2 \xrightarrow{\Delta} CuO + H_2O\uparrow$

2. $2Na + 2H_2O \longrightarrow 2NaOH + H_2\uparrow + Heat$

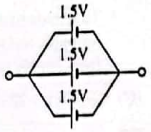
(C) 1. Treat and diagnose diseases like cancer.
2. It stimulates body's organs to respond to emergencies.
3. It is used for measuring the electric resistance.

2

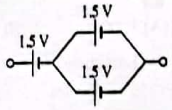
(A) 1. b 2. c 3. d 4. c 5. a

(B) 1. *Look at the main book on page (245).*
2. *Look at the main book on page (134).*

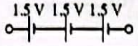
(C) 1. e.m.f = 1.5 volt



2. e.m.f = 3 volt



3. e.m.f = 4.5 volt

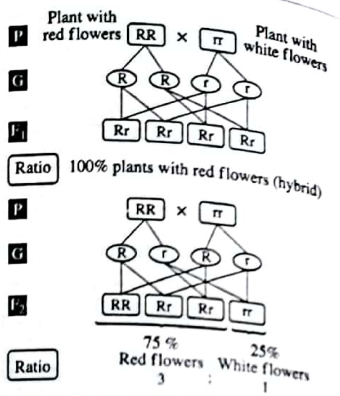


3

(A) 1. $2NaNO_2$ 2. Growth 3. neutralization
4. independent assortment of hereditary.
5. oxidizing

(B) 1. The human will suffer from simple goiter.
2. The rate of decomposition of hydrogen peroxide increases.
3. The electric current will flow from conductor (B) that has the higher electric potential to the other conductor (A)

(C)



4

(A) 1. white 2. oxygen 3. ductless
4. sievert. 5. enzymes.

(B) 1. Due to the decomposition of green copper carbonate by heating into copper oxide (black) and carbon dioxide gas evolves

$$CuCO_3 \xrightarrow{\Delta} CuO + CO_2\uparrow$$

2. Because the reactions of ionic compounds take place between ions, while the reactions of covalent compounds take place between molecules.

3. To insure that the plant doesn't be self-pollinated.

(C) t = 60 sec.

$\because I = \frac{V}{R} = \frac{6}{3} = 2$ ampere

$\therefore q = I \times t = 2 \times 60 = 120$ coulomb

27 Matrouh Governorate

1

(A) 1. b 2. b 3. c 4. c 5. d

(B) 1. Due to the presence of a layer of aluminium oxide (Al_2O_3) on aluminium surface, which takes time to separate from aluminium, which delays the starting of occurrence of the reaction.

2. Becauses : - It can be transferred for long distances through wires.
- It can be changed into a direct current.

3. Becauses they release unseen rays spontaneous as a result of their atom's nuclei containing neutrons more than required for their stabilization.

(C) 1. $I = \frac{q}{t} = \frac{30}{60} = 0.5$ ampere

2. $R = \frac{V}{I} = \frac{2}{0.5} = 4$ ohm.

2

(A) 1. Hydrogen. 2. enzyme 3. faster
4. acquired 5. $4NO_2$

(B) 1. It is used to control the current intensity and potential difference in the electric circuit.

2. - To convert sand to silicon sheets which is used in manufacturing of computer processors and programmed electric circuits that are used in electric appliances.
- To discover defects in manufactured products.

3. It increases the speed of decomposition of hydrogen peroxide

(C) 1. (a) Direct electric current.
(b) Alternating electric current.
2. (a) Electrochemical cells
(b) Electric generators such as dynamoes.

3

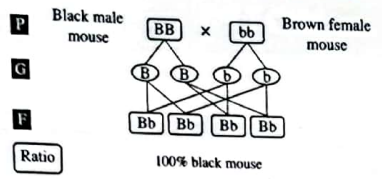
(A) 1. Neutralization reaction.
2. The ohm. 3. Chromosome.
4. Chemical activity series. 5. Enzyme.

(B) 1. *Look at the main book on page (171).*

2. $Zn + 2HCl \xrightarrow{dil.} ZnCl_2 + H_2\uparrow$

$Cu + HCl \xrightarrow{dil.}$ No reaction

(C)



4

(A) 1. copper oxide and water vapour.
2. seven 3. Watson and Crick
4. equal 5. kinetic

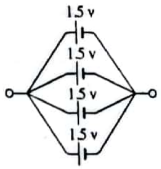
(B) 1. The speed of chemical reaction increases

2. $NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$ (white ppt.)

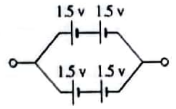
3. A silvery precipitate of mercury is formed and oxygen gas evolves

$$2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$$

(C) (1) e.m.f = 1.5 volt



(2) e.m.f = 3 volt



Answer the following questions :

Question 1 — 5 marks

A Complete the following sentences : *(2 marks)*

1. When four cells are connected in a parallel way and the e.m.f for each one 1.5 volt. The e.m.f for the battery = ... volt.
2. They are parts of DNA present on the chromosomes and control the hereditary traits of the individual is known as .....
3. Radioactive elements are elements whose atoms nuclei contain a number of ..... more than the number that is required for its stability.
4. Mendel removed the stamens of the pea plant flowers to prevent the occurrence of .....

B Correct the underlined words : *(2 marks)*

1. By using 3gm of catalyst in an experiment. Its mass after finshing the reaction is **less than** 3 gm.
2. To stimulate body's organs to respond to emergencies adrenal gland secretes **insulin** hormone.
3. Rate of reaction of the dilute hydrochloric acid with iron filling is **slower** than that with the same mass of a piece of iron.
4. **Thyroid** gland secrets a hormone that organizes the growth and development of sexual organs in the human body.

C What happens when ... ? : *(1 mark)*

Two charged conductors connected with each other one of them has higher electric potential from the other.

Question 2 — 5 marks

A Write the scientific term for each of the following : *(2 marks)*

1. Reaction of an acids and an alkali to give salt and water.
2. The measuring unit of absorbed nuclear radiation.
3. A chemical process in which an atom of the element gains one electron or more.
4. It is the state of an electric conductor that shows the transfer of the electricity from or to it, when it is connected to another conductor.

B Choose the correct answer : *(2 marks)*

1. All the following affect on speed of chemical reactions except .....
   a. reactants concentration. b. nature of reactants.
   c. temperature of the reaction. d. nature of products.
2. Genes controls in hereditary traits for living organisms by producing .....
   a. hormones. b. enzymes. c. fats. d. vitamins.

3. In the following reaction : $H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$ ..... acts as reducing factor.

a. H_2O b. CuO c. H_2 d. Cu

4. Mendel covered ..... of the pistils of a pea plant, to avoid cross pollination.

a. sepals b. stigmas c. stamens d. petals

C Explain : *(1 mark)*

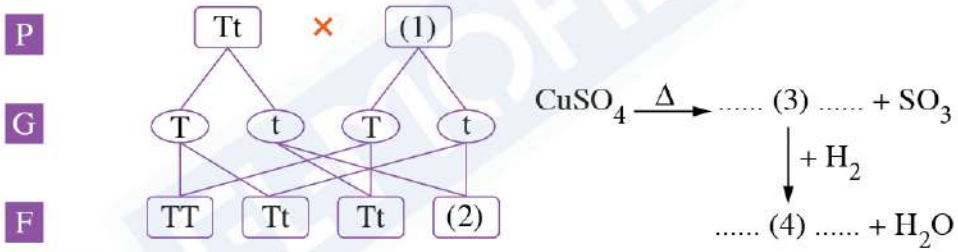
The effects of exposure to small doses of nuclear radiation for a long period of time.

Question 3 *5 marks*

A Put (✓) or (✗) : *(2 marks)*

1. The first to be affected by nuclear radiation in the human body is bone marrow. ( )
2. The glucagon hormone is secreted from the adrenal gland. ( )
3. Potential difference = the work × amount of electricity. ( )
4. The decrease in secretion of estrogen hormone causes diabetes disease. ( )

B Replace the digits (1), (2), (3) and (4) by suitable letters : *(2 marks)*



C How can detect the evolved gas from reaction between Na_2CO_3 and dil. HCl. *(1 mark)*

Question 4 *5 marks*

A Mention the symbol that represents each of the following : *(2 marks)*

1. The most active metal in the chemical activity series.
2. The least active metal in the chemical activity series.
3. The ammeter in the electric circuit.
4. The voltmeter in the electric circuit.

B Cross out the odd word : *(2 marks)*

1. Current intensity – Catalyst – Potential difference – Electric resistance.
2. Hair color – Skin color – Swimming – Blood group.
3. Sodium – Uranium – Radium – Cesium.
4. Free ear lobe – Narrow eyes – Curly hair – Rolling a tongue.

C Give reason for : *(1 mark)*

Reactions between ionic compounds are fast.

Answer the following questions :

Question 1 — 5 marks

A Complete the following sentences : *(2 marks)*

1. The ..... is used to measure the electromotive force of a battery.
2. The chromosome is chemically consists of a nucleic acid called ..... combined with protein.
3. Electric cells produce ..... electric current.
4. The traits that are transmitted from one generation to another is the .....

B Correct the underline words : *(2 marks)*

1. Dwarfism is a disease caused by decreasing of secretion in the **calcitonin** hormone at the childhood.
2. On heating copper hydroxide, we obtain **copper and hydrogen**.
3. The reactions of ionic compounds are **slower** than those of the covalent compounds.
4. **Estrogen** promotes the growth of endometrium.

C What happens when ... ? : *(1 mark)*

Exposing a man for a large dose of nuclear radiation for a short period of time.

Question 2 — 5 marks

A Write the scientific term for each of the following : *(2 marks)*

1. A substance which changes the rate of the chemical reaction without being changed.
2. The process of spontaneous decaying of atoms of some elements present in nature to reach a more stable condition.
3. The resistance of a conductor that allows the passing of an electric current of 1 ampere through it when the potential difference between its two ends is 1 volt.
4. An arrangement of the metals elements in a descending order according to their chemical activity.

B Mention the color that is : *(2 marks)*

1. Formed when heating red mercuric oxide.
2. Formed when adding silver nitrate solution to sodium chloride solution.
3. Considered as dominant color of the seed of the pea plant.
4. Considered as recessive color of the flower of the pea plant.

C A battery consists of three electric cells the e.m.f of cell each cell is 2 volts. Calculate the electromotive force of the battery when the cells are connected :

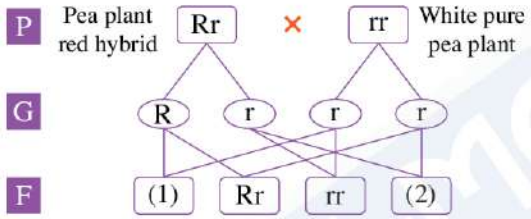
1. In series. *(1 mark)*
2. In parallel (explaining your answer to drawing in each case).

Question 3 — 5 marks

A Choose the correct answer : (2 marks)

1. Calcitonin hormone controls ..... level in the blood.
   a. potassium b. oxygen c. calcium d. iron
2. In dynamo, ... energy is converted into electric energy.
   a. magnetic b. kinetic c. chemical d. light
3. The hormone that promotes the growth of endometrium is the ..... hormone.
   a. testosterone b. progesterone c. estrogen d. growth
4. From the properties of direct current is .....
   a. change intensity. b. change direction.
   c. constant intensity and direction. d. change intensity and direction.

B Replace the digits (1), (2), (3) and (4) by suitable letters. (2 marks)



$$HCl + NaOH \longrightarrow \text{..... (3) .....} + H_2O$$
$$\downarrow + AgNO_3$$
$$NaNO_3 + \text{..... (4) .....}$$

C Compare between : (1 mark)

Ionic compound and covalent compound (as in the speed of reaction).

Question 4 — 5 marks

A Put (✓) or (✗) : (2 marks)

1. In chemical activity series, metallic elements are arranged in a descending order according to their atomic weights. ( )
2. The measuring unit of absorbed nuclear radiation is the ohm. ( )
3. Oxidation is a chemical process in which an atom loses one proton or more. ( )
4. Zirconium is considered as radioactive element. ( )

B Cross out the odd word : (2 marks)

1. Ammeter – Voltmeter – Ohmmeter – Catalytic converter.
2. Rolling the tongue – Smooth hair – Narrow eyes – Facial freckles.
3. Physical effects – Magnetic effects – Genetic effects – Cellular effects.
4. Playing football – Playing music – Swimming – Skin color.

C Explain why copper doesn't react with dilute hydrochloric acid. (1 mark)

Answer the following questions :

Question 1 — 5 marks

A Mention the name of scientist (s) who : *(2 marks)*

1. Deduced the relation between the electric current and the potential difference. (.....)
2. Discovered the means of how the genes control the appearance of genetic traits. (.....)
3. Discovered the radioactivity phenomenon. (.....)
4. Made a model of DNA molecule is composed of two strands coiled around each other. (.....)

B Complete the following statements : *(2 marks)*

1. The change in the concentration of reactants and resultants in a unit time is known as .....
2. When the amount of glucose decrease in the blood, pancreas secretes of ..... hormone.
3. The breaking up of bonds in the molecules of reactants and the formation of new bonds in the molecules of product is called .....
4. When the amount of iodine decreases in the food, the secretion of the ..... hormone decreases.

C Compare between : *(1 mark)*

Natural resources of nuclear radiation pollution and artificial resources of nuclear radiation pollution (as in one example for each).

Question 2 — 5 marks

A Correct the underlined words : *(2 marks)*

1. **Oxidation** is a chemical process in which an atom gains one electron or more.
2. **Ohm** is the measuring unit for absorbed nuclear radiation.
3. In **positive catalysts** reaction, catalyst is used to slow down the chemical reaction.
4. Alternating current is characterized by **constant** intensity and direction.

B Put (✓) or (✗) : *(2 marks)*

1. According to Mendel's second law, the Mendel's ratio for each pair of inherited traits equal 1 : 1 ( )
2. From the dominant traits in the human being is the free ear lobe. ( )
3. The speed of the chemical reaction increases by increasing the concentration of the reactants. ( )
4. Copper sulphate decomposes by heat into copper oxide and carbon dioxide gas. ( )

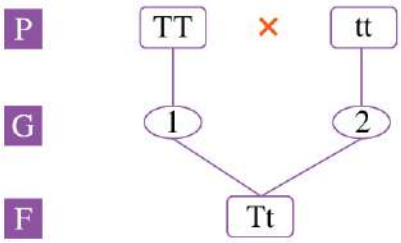
C If the work done to transfer quantity of charge of 30 coulomb between two points equal 3330 joule. **Calculate the potential difference.** *(1 mark)*

Question 3 — 5 marks

A Cross out the odd word : (2 marks)

1. Joule – Ampere – Volt/ohm – Coulomb/sec.
2. Dwarfism – Gigantism – Simple goiter – Pancreas.
3. Selenium – Potassium – Polonium – Rubidium.
4. Testosterone – Insulin – Estrogen – Progesterone.

B Replace the digits (1) , (2), (3) and (4) by suitable letters : (2 marks)



$$NaCl + AgNO_3 \longrightarrow \text{..... (3) .....} + AgCl$$

$$\text{..... (3) .....} \xrightarrow{\Delta} NaNO_2 + \text{..... (4) .....}$$

C Give reason for : (1 mark)

The fridge is used to preserve food.

Question 4 — 5 marks

A Choose the correct answer : (2 marks)

1. The sliding rheostats is used in ..... in the electric circuit.
   a. measuring potential difference b. measuring resistance
   c. change the value of resistance d. measuring current intensity
2. On connecting 5 electric cells have the same electromotive force on parallel, the e.m.f of each cell is 2.5 volts, so the total e.m.f equals ..... volts.
   a. 2.5 b. 5 c. 7.5 d. 12.5
3. The reaction between acid and alkali to form salt and water is called ..... reaction.
   a. oxidation and reduction b. simple substitution
   c. thermal decomposition d. neutralization
4. The compound decomposes by heat into its simple components in ..... reactions.
   a. oxidation and reduction b. simple substitution
   c. thermal decomposition d. neutralization

B Write the scientific term : (2 marks)

1. The potential difference between the two poles of the battery when the electric circuit is open.
2. The changes that appear on a living organism when exposed to nuclear radiation.

3. The individual who carries two genetic factors one of the dominant trait and the other of the recessive trait.
4. The appearance of a hereditary trait in the individuals of the first generation when two individuals are crossed over, one of them carries a pure trait contrasting the trait carried by the other individual.

C Amr placed a piece of zinc in a dilute hydrochloric acid solution, with the formation of gas bubbles around the piece of zinc : *(1 mark)*

1. What is the name of the evolving gas ?
2. What is the type of reaction ?

Answers of model 1

1 a. 1. 1.5 2. genes
3. neutrons 4. self pollination.

b. 1. equal to 2. adrenalin
3. faster 4. pituitary

c. The electric current will pass from the conductor of high electric potential to that of low electric potential.

2 a. 1. Neutralization reaction 2. Sievert
3. Reduction 4. Electric potential

b. 1. d 2. b 3. c 4. b

c. physical effects, genetic effects and cellular effects.

3 a. 1. (✓) 2. (✗) 3. (✗) 4. (✗)

b. 1. Tt 2. tt 3. CuO 4. Cu

c. CO_2 gas turbids clear limewater.

4 a. 1. K 2. Au 3. —(A)— 4. —(V)—

b. 1. catalyst 2. swimming
3. sodium 4. narrow eyes

c. Because it occurs between ions.

Answers of model 2

1 a. 1. Voltmeter 2. DNA 3. direct
4. hereditary traits.

b. 1. growth 2. copper oxide and water
3. faster 4. progesterone

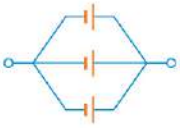
c. That leads to damage of bone marrow, digestive system and central nervous system.

2 a. 1. catalyst 2. Natural radioactivity
3. Ohm 4. chemical activity series

b. 1. silver 2. white 3. yellow 4. white

c. 1. e.m.f of battery = e.m.f of one cell × n
= 2 × 3 = 6 volt

2. e.m.f of battery = e.m.f of one cell
= 2 volt



3 a. 1. c 2. b 3. b 4. c

b. 1. Rr 2. rr 3. NaCl 4. AgCl

c. Ionic compound : Faster reaction –
Covalent compound : Slower reaction.

4 a. 1. (✗) 2. (✗) 3. (✗) 4. (✓)

b. 1. Catalytic converter
2. Rolling the tongue
3. Magnetic effects
4. Skin color

c. Because copper is less active than hydrogen in CAS.

Answers of model 3

1 a. 1. Ohm 2. Badel and Tatum
3. Henri Becquerel
4. Watson and Crick

b. 1. Speed of chemical reaction.
2. glucagon 3. chemical reaction
4. thyroxin

c. Natural resource : cosmic radiation –
Artificial resource : nuclear wastes

2 a. 1. Reduction 2. Sievert
3. negative catalyst 4. variable

b. 1. (✗) 2. (✓) 3. (✓) 4. (✗)

c. $V = \frac{W}{Q} = \frac{3330}{30} = 111$ volt

3 a. 1. Joule 2. Pancreas 3. Potassium
4. Insulin

b. 1. T 2. t 3. $NaNO_3$ 4. O_2

c. Because the low temperature in the fridge slows down the speed of the chemical reactions done by bacteria which cause the rot of food.

4 a. 1. c 2. a 3. d 4. c

b. 1. e.m.f. 2. physical changes
3. Hybrid individual
4. principle of complete dominance

c. 1. Hydrogen gas
2. Simple substitution reaction

Final Examinations 2018

1 Cairo Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. The instrument which is used to measure the electric potential difference is .....
2. The chromosome is chemically consisted of a nucleic acid called DNA binds with the .....
3. Sodium metal reacts with water producing sodium hydroxide and ..... gas evolves.
4. The scientist Mendel named the trait that appears in all individuals of the first generation as the ..... trait, while the other (contrasting) trait that disappears in the individuals of the first generation as the ..... trait.

B Define each of the following :

1. The chemical activity series.
2. The radioactivity phenomenon.
3. The electric current.

C Calculate the electric current intensity due to the flow of quantity of electricity of 6000 coulomb through a cross-section of a conductor for 5 minutes.

Question 2

A Choose the correct answer :

1. From the dominant traits in the human being is the ..... trait.
   a. straight hair b. wide eyes
   c. absence of dimples in the face d. presence of freckles in the face
2. According to Mendel's second law, each pair of the alternative traits is inherited independently of the others and appears in the second generation at a ratio of .....
   a. 1 : 1 b. 2 : 1 c. 3 : 1 d. 4 : 1
3. The sliding rheostat is used to ..... in the electric circuit.
   a. measure the resistance b. measure the potential difference
   c. measure the current intensity d. change the resistance
4. Carbon dioxide evolves during thermal decomposition of ..... compound.
   a. HgO b. $CuSO_4$ c. $CuCO_3$ d. $Cu(OH)_2$

PART 3

5. The ratio between the potential difference across two ends of a conductor and the electric current intensity passing through it is equal to .....

a. e.m.f. b. electric current.

c. quantity of electricity. d. electric resistance.

B A battery consists of three electric cells, the e.m.f. of each cell is 3 volt. Calculate the e.m.f. when the cells are connected :

1. In series. 2. In parallel. (Write the law used in each case)

C What would happen when .... ?

1. The human body exposed to a large dosage of radiation for a short time.
2. Heating of sodium nitrate.
3. Adding silver nitrate solution to sodium chloride solution.

Question 3

A Write the scientific term for each of the following :

1. The change in the concentration of the reactants and products at a unit time.
2. Reaction between an acid and an alkali forming salt and water.
3. The substance which gains an electron or more during a chemical reaction.
4. The breaking up of bonds in reactants molecules and formation of new bonds in the products molecules.
5. A reaction where double substitution occurs between the ions of two compounds to form two other new compounds.
6. The charges transmitted by a current intensity with one ampere in one second.

B Compare between :

1. The direct electric current and the alternating electric current.
(Concerning : the intensity & direction)
2. Oxidation and reduction. (Concerning : the definition)

Question 4

A Rewrite the following statements after correcting the underlined words :

1. Mendel's first law is called the law of **independent assortment of hereditary factors**.
2. Nitrogen pentoxide breaks up into nitrogen dioxide gas and **nitrogen** gas.
3. The reaction of ionic compounds is **slower** than that of covalent compounds.
4. The scientist Mendel has found out that the hereditary traits are transmitted from the parents to the offspring by means of hereditary factors, they are now called the **enzymes**.
5. In electric generator (dynamo), the **heat** energy converts to electric energy.

B Give reasons for the following :

1. Occurrence of reaction between magnesium and copper sulphate solution.
2. The scientist Mendel chooses the pea plant to conduct his researches.

C Explain on genetic bases :

The genetic composition of the parents and offspring produced from crossing a pea plant with pure dominant yellow seeds with another with recessive green seeds.
(Y dominant – y recessive)

Additional questions

A Choose the correct answer :

1. The ceramic cells in the catalytic converter leads to .....
   a. increasing the surface area exposed to the reaction.
   b. increasing the concentration of the reactants.
   c. increasing the temperature.
   d. no correct answer.
2. All of the following are considered from endocrine glands except ..... gland.
   a. pituitary b. thyroid c. adrenal d. sweat

B Give a reason for :

Endocrine glands are called ductless glands.

2 Giza Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. Na_2CO_3 + ... $\longrightarrow$ $2NaCl + H_2O + CO_2$
2. One of the properties of the direct current is that .....
3. Every hereditary trait is controlled by two hereditary factors which separate during formation of the .....
4. The gene controls the appearance of a hereditary trait of the living organism by giving ..... which is responsible for the occurrence of a chemical reaction resulting in a protein.

B Compare between :

1. Oxidation and reduction (concerning : the definition).
2. Genetic effects and cellular effects of radiation.

C What is meant by ..... ? Resistance of a conductor is 25 ohm.

PART 3

Question 2

A Choose the right answer :

1. Double substitution reactions between salt solutions are accompanied by formation of .....
   a. a metal. b. a precipitate. c. an oxide. d. a non-metal.
2. The nuclear energy is peacefully used in the industrial field to convert sand to ..... for manufacturing computer processors.
   a. electric energy b. silicon sheets c. nuclear fuel d. atomic bombs
3. The scientists ..... discovered the means of how the gene controls the appearance of the hereditary trait.
   a. Mendel and Newton b. Watson and Crick
   c. Johansen & Mendel d. Badel and Tatum
4. Mendel's second law is known as the law of ..... of factors.
   a. independent assortment b. segregation c. merging d. disappearance

B Give reasons for the following :

1. Mendel chose pea plant to make his experiments.
2. Some electric circuits contain variable resistance.

C Calculate the work done to transfer an electric charge of 20 coulomb through a conductor, if the potential difference between its ends is 50 volt.

Question 3

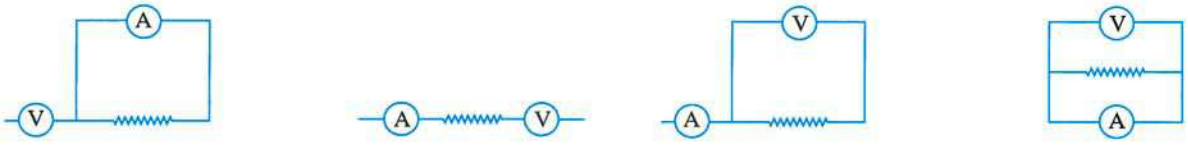
A Write the scientific term for each of the following :

1. The catalyst that is used to slow down a chemical reaction.
2. The quantity of electricity (electric charge) flowing through a cross-section of a conductor in one second.
3. The individual that carries similar pair of hereditary factors either dominant or recessive.
4. The arrangement of metals in a descending order according to their chemical activity.

B What happens when ... ?

1. Replacing dilute hydrochloric acid by concentrated hydrochloric acid when reacting with magnesium.
2. Two pure individuals bearing two pairs of contrasting traits are crossed.

C Which one of the following figures represents a part of an electric circuit that contains an ammeter and a voltmeter connected in right way ?



(a) (b) (c) (d)

Question 4

A Correct the underlined parts in the following :

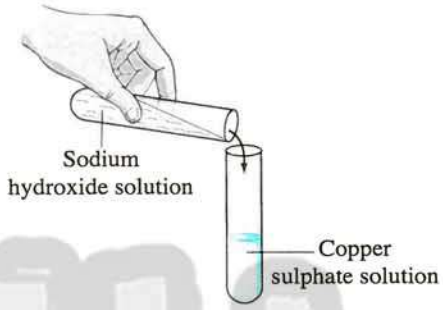
1. Mendel chose **eleven** main traits of pea plant to conduct his experiments.
2. When adding magnesium pieces to copper sulphate solution, a **black** precipitate is formed.
3. The electromotive force of three identical cells connected in parallel is **twice** the electromotive force of one cell.
4. $2Na + 2H_2O \longrightarrow 2NaOH + \underline{O_2}\uparrow + heat$

B What is meant by ... ?

1. Hereditary traits.
2. Thermal decomposition reactions.

C In the opposite figure :

How is the rate of this reaction measured ?



Additional questions

Choose the correct answer :

1. Pituitary gland is called the ..... gland.
   a. activity b. master c. main d. (b) or (c)
2. The hormone which determines the height that the person will reach at adulthood stage is ..... hormone.
   a. thyroxin b. insulin c. testosterone d. growth
3. The hormone which regulates the level of calcium in blood is the ..... hormone.
   a. calcitonin b. thyroxin c. progesterone d. adrenalin

3 Alexandria Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. The measuring unit of the absorbed radiation is .....
2. The ability to roll the tongue is one of the ..... traits in the human being.
3. The rate of decomposition of hydrogen peroxide increases by adding ..... or a piece of .....

PART 3

B If you have copper sulphate solution, pieces of magnesium, sodium nitrate, test tubes and a flame. Show by balanced symbolic equations how to get :

1. Copper metal.
2. Oxygen gas.

C Mention two properties of the catalyst.

Question 2

A Write the scientific term for the following :

1. The change in the concentration of the reactants and resultants at a unit time.
2. It is the state of an electric conductor that shows the transfer of the electricity from or to it when it is connected to another conductor.
3. The traits that are transferred from a generation to another such as blood group.

B If you have a voltmeter, an ammeter, a switch, a fixed resistance, a rheostat, connecting wires and three electric cells connected in series :

1. Draw an electric circuit to illustrate the relation between the current intensity and the potential difference.
2. If you know that the e.m.f. of each cell in the previous circuit is 2 volt, find the value of the fixed resistance if the reading of the ammeter was 6 ampere.

C Mention one of the peaceful uses of nuclear energy.

Question 3

A What is the reducing agent in the following two reactions ? (mention the reason)

1. $CuO + H_2 \xrightarrow{\Delta} Cu + H_2O$
2. $2Na + Cl_2 \longrightarrow 2NaCl$

B Correct the underlined parts in the following :

1. Genes are parts of DNA found in the **cytoplasm** of the cell.
2. In the circuit of the direct current, **molecules** flow from one of the two poles to the other in the electrochemical cell.

C Mention the law of segregation of factors of Mendel.

Question 4

A Choose the right answer :

1. All of the following are radioactive elements except .....
   a. radium. b. uranium. c. iron. d. cesium.
2. On adding silver nitrate solution to sodium chloride solution, ... is formed.
   a. a white precipitate of sodium nitrate
   b. a white precipitate of silver chloride
   c. a blue precipitate of silver chloride
   d. no precipitate

3. The measuring unit of the quantity of electricity is .....

a. ampere. b. coulomb. c. volt. d. joule.

4. For measuring the electric resistance, ... device is used.

a. ohmmeter b. ammeter c. voltmeter d. sliding rheostat

B Give reasons for :

1. The rate of the reaction of hydrochloric acid with the iron filings is faster than that with a piece of iron of the same mass.
2. Mendel selected the pea plant to conduct his experiments.

C Explain on crossing between a plant of green seeds (recessive trait) with another of yellow seeds (dominant trait), the produced plants with green seeds.

Additional questions

A Complete :

1. The most modern cars are equipped with ..... which helps in treatment of harmful gases emitted from the car engine.
2. Below the brain, there is a small gland called ..... , and inspite of its small size it is called ..... or .....

B Put (✓) or (×) in front of the following sentences :

1. Sodium carbonate is used in polishing silver. ( )
2. The calcitonin hormone controls the level of calcium in the human body. ( )

4 El-Kalyoubia Governorate

Answer the following questions :

Question 1

A Write the scientific term of the following sentences :

1. Its chemical structure is DNA with protein.
2. The potential difference between two poles of the electric source when the electric circuit is opened.
3. The material which increases the speed of reaction without being changed.
4. The quantity of charge transferred by a fixed current 1 ampere per a second.
5. The genetic map of genes in human chromosomes.

PART 3

B The following figures show two graphs for two different types of an electric current :

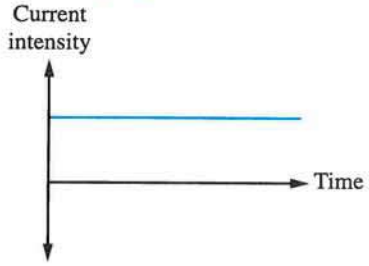


Figure (1)

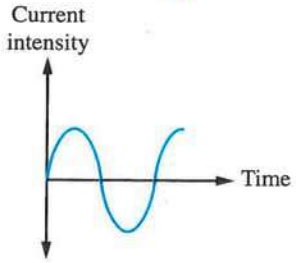


Figure (2)

1. Which of the two graphs expresses the current which is able to transmit for long distances ?
2. Mention the type of the current you choose and the source from which it is produced.

C Give reasons for :

1. The ability to wrap (roll) the tongue is from the dominant characteristics in human.
2. A variable resistor (sliding rheostat) is connected in the electric circuit.
3. Copper does not react with hydrochloric acid (HCl), whereas zinc reacts with hydrochloric acid (HCl).

Question 2

A Choose the correct answer :

1. Genes control the organism's genetic characteristics by producing .....
   a. hormones. b. enzymes. c. fats. d. vitamins.
2. The unit of measuring the absorbed radiation is .....
   a. joule. b. coulomb. c. rem. d. newton.
3. If vaccination occurs between two individuals, both of them are hybrid and 200 members resulted from this vaccination, then the hybrid members produced may be ..... individual.
   a. 50 b. 100 c. 150 d. 200
4. The reaction $2Cl^- \longrightarrow Cl_2 + 2e^-$ represents ..... process.
   a. oxidation b. reduction c. association d. substituting
5. When hydrochloric acid reacts with sodium carbonate, then the reaction produces gas which .....
   a. turbids limewater. b. burns with pop sound.
   c. increases ignition. d. its colour is red brown.

B There are three identical electric cells whose e.m.f. = 6 volt are connected in the electric circuit by a certain method and the total resistance = 4 ohm (Ω). Show by drawing and solving how the circuit is connected to obtain a current = 1.5 ampere.

C **The hybridization in the Drosophila between a male and a female, both of them are long wings and the product is 27 members with long wings and 9 members with short wings. Explain that on genetic bases (If the symbol of long wing is T and short wing is t).**

Question 3

A **Put (✓) or (×) in front of the following sentences :**

1. A member which gains one gene for freckles in the face becomes without this feature. ( )
2. The chemical reaction is a process of breaking up of bonds between molecules of reactants and formation of new bonds in products molecules. ( )
3. The hybrid individual carries a gene for the dominant characteristic and another one for the recessive characteristic. ( )
4. Reaction of iron filings (powder) with sulphuric acid H_2SO_4 becomes slower than the reaction of block of iron with the same acid. ( )
5. Radium is one of the natural radioactive elements. ( )

B **Show by using balanced chemical equations the effect of heat on the following compounds :**

1. Copper hydroxide.
2. Mercuric oxide.

C **If the work done = 1000 Joule needed to transfer a quantity of electricity = 100 coulomb in a conductor during 20 second. Find :**

1. The current intensity passing in the conductor.
2. The resistance of a conductor.

Question 4

A **What happens ... ?**

1. When the dominant gene exists with another for the same characteristic.
2. To the number of collisions when the temperature of the reaction is raised up.
3. When manganese dioxide (MnO_2) is added in a test tube that contains hydrogen peroxide.
4. If there is a mating between two individuals resulting in producing 50% dominant individuals and 50% recessive individuals.
5. When the potential difference increases between two ends of a conductor with a fixed resistance in the closed circuit.

B **1. Under what conditions do the elements become naturally radioactive ?**

2. Compare between controlled industrial radioactive and uncontrolled industrial radioactive (in terms of their uses).

PART 3

C From the two chemical reactions, answer the following questions :

- $(A) + AgNO_3 \longrightarrow$ Precipitate + (B)
- $2(B) \xrightarrow{\Delta} 2NaNO_2 + (D)$

1. Write the chemical formula of (A) and (B).
2. What is the name of gas (D) and how do you discover it ?
3. Write the chemical formula of the precipitate and its colour.

Additional questions

A Put (✓) or (×) in front of the following sentences :

1. Dwarfism is the continual growth of human limbs, so the person becomes a giant. ( )
2. Sodium carbonate is used in polishing silver. ( )

B Write the scientific term for each of the following statements :

1. A metallic can exists in most modern cars to treat the harmful gases emitted from the engine.
2. They are considered one of the most important safety means in cars at emergencies.

5 El-Sharkia Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. $2N_2O_5 \longrightarrow$ ..... $+ O_2$
2. The ..... is considered a part of DNA which consists of smaller structural units called .....
3. Iron rust is a ..... chemical reaction, while a firework is a ..... chemical reaction.

B What is meant by each of the following ..... ?

1. Ohm's law.
2. The rate of chemical reaction.
3. The law of independent assortment of the hereditary factors.

C Calculate the current intensity due to the flow of 5400 coulomb through across-section of a conductor for 5 minutes.

Question 2

A Choose the correct answer :

1. Which one of these traits is dominant in humans ? .....

a. Smooth hair. b. Freckles in the face. c. Wide eyes. d. Absence of dimples.

2. The charge transmitted by a constant current of intensity one ampere in one second is .....
   a. coulomb. b. volt. c. joule. d. ohm.
3. The most active metal in the chemical activity series is .....
   a. copper. b. sodium. c. hydrogen. d. aluminium.
4. The recessive trait appears in one of the sons if he inherited from his parents .....
   a. two dominant genes. b. one dominant gene.
   c. a recessive gene. d. a recessive gene and a dominant gene.
5. If a pollination occurs between two hybrid individuals, the product is 200 individuals, so the number of produced hybrid individuals is likely to be ..... individual.
   a. 50 b. 100 c. 150 d. 200

B What happens ..... ?

1. To the colour of solution as time passes when adding sodium hydroxide solution to blue copper sulphate solution. (Without equations)
2. When exposing a man for a large dosage of radiation for a short period of time.
3. When heating most metal sulphates. (Without equations)

C Compare by drawing only between :

The direct current and the alternating current.

Question 3

A Write the scientific term for each of the following :

1. It's the substance which speeds up the chemical reaction without changing.
2. The resistance of a conductor that allows the passing of an electric current of 1 ampere through it when the potential difference across its ends is 1 volt.
3. The process of spontaneous decaying of atoms of some elements present in nature to reach a more stability.
4. The trait that appears in all individuals of the first generation in Mendel's experiments.
5. A type of connection of similar electric cells used to obtain high (twice) e.m.f. (electromotive force).

B Illustrate by balanced chemical equations the following reactions :

1. The effect of heat on sodium nitrate.
2. The reaction of diluted hydrochloric acid with sodium carbonate.

C Give reasons for :

1. Mendel selected (chose) the pea plant to conduct his experiments.
2. The radioactive wastes should be buried away from underground water's path.
3. The speed of the chemical reaction increases as the concentration of the reactants increases.

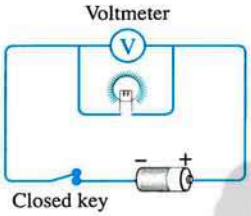
PART 3

Question 4

A Rewrite the following statements after correcting the underlined words :

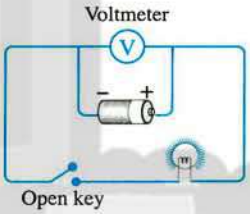
1. Mendel removed the **petals** from the pea plant flowers before the anther becomes mature.
2. In dry cell, **mechanical** energy is converted into electric energy.
3. Metals substitute hydrogen of water to produce metal **carbonate** and hydrogen gas evolves.
4. The ratio of gametes "TR" in a pea plant whose genetic structure TtRr is **75%**.
5. Some traits are not transmitted from one generation to another and they are called the **hereditary traits**.

B (1) Complete :



The voltmeter is used to measure .....

(2) Complete :



The voltmeter is used to measure .....

C (1) When hydrogen passes through hot copper oxide, hydrogen takes the oxygen away from copper oxide and water is formed and copper oxide turns into copper.

(1) Show this by symbolic balanced chemical equation with writing the conditions of the reaction.

(2) Determine the substance which is oxidized–reduced.

(2) Mention the name of the scientists who discovered the means of how the gene controls the appearance of a trait.

Additional questions

A Give reasons for :

1. Iodine salt is preferred than the normal salt.
2. Some persons have enlarged thyroid gland.
3. Pancreas is a double function gland.

B Complete :

In the catalytic converter, the ceramic cells covered with a thin layer of ..... metal as ..... or palladium.

6 El-Menofia Governorate

Answer the following questions :

Question 1

A Write the scientific term for each of the following :

1. An arrangement of metals in a descending order according to the degree of their chemical activity.
2. A chemical process which causes the increase in the oxygen percentage or decrease in the hydrogen percentage in a substance.
3. It is the state of an electric conductor that shows the transfer of electricity from or to it when it is connected to another conductor.
4. The opposition that the electric current faces during its passage in a conductor.
5. It chemically consists of a nucleic acid called DNA binds with protein.
6. The plant that is used by Mendel in his experiments.

B In front of you in the school lab the following substances :

(Hydrochloric acid – Silver nitrate – Sodium carbonate – Sodium chloride)

Explain how can you get : by symbolic balanced chemical equations.

1. A white precipitate.
2. A gas turbids limewater.

C What happens in the following cases ..... ?

1. A gene failed to produce its own enzyme.
2. Human body is exposed to a large dosage of radiation for a short time.

Question 2

A Extract the unsuitable words, then write the link between the rest :

1. Diagnose some diseases – Eliminate pests – Drilling for petroleum – Ohmmeter.
2. Pressure – Potential difference – Electric resistance – Current intensity.
3. Convert mechanical energy to electric energy – Produce alternating current – Produce direct current – Used in lighting of houses.
4. Ability to roll the tongue – Attached ear lobe – Curly hair – Wide eyes.

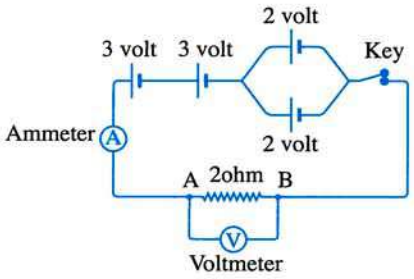
B Compare between :

1. Metal oxide and metal hydroxide (the effect of heat on both of them).
2. Hereditary traits and acquired traits (concerning : the definition).
3. Ordinary rice and genetically modified rice (concerning : the vitamins exist in both of them).

PART 3

C In the opposite figure. Calculate :

1. The reading of the ammeter.
2. The work done to transfer the electric charge between (A) and (B) during 2 minutes.



Question 3

A Choose the correct answer :

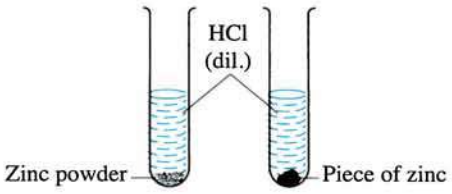
1. The two hereditary factors of the trait are similar in ..... individual.
   a. pure dominant b. hybrid
   c. recessive d. pure dominant and recessive
2. Electric current intensity = ...
   a. $q \times t$ b. $\frac{q}{t}$ c. $V \times R$ d. $\frac{R}{V}$
3. ..... is used to measure the electromotive force (e.m.f.) of a battery.
   a. Voltmeter b. Ohmmeter c. Ammeter d. The sliding rheostat
4. In the following reaction : $H_2 + CuO \xrightarrow{\Delta} H_2O + Cu$ ..... is the oxidizing agent.
   a. CuO b. H_2O c. Cu d. H_2
5. If two hybrid individuals crossing with each other and (300) individuals produced due to this crossing, so the number of hybrid individuals among the offspring is likely to be ..... individual.
   a. 50 b. 100 c. 150 d. 200

B Explain the importance of each of the following :

1. The sliding rheostat in electric circuit.
2. Electric transformer.
3. The human genome.

C From the opposite figures. Show :

1. The type of the chemical reaction.
2. The factor that affects the speed of this reaction.
3. Write the balanced symbolic chemical equation express this reaction.



Question 4

A Complete the following :

1. $2N_2O_5 \longrightarrow$ ..... $+ O_2 \uparrow$
2. When blue copper sulphate is heated, ... gas evolves.

3. ..... are parts of DNA on the chromosomes and control the hereditary traits of the individuals.
4. ..... is considered as very slow chemical reactions.
5. ..... is a device used to provide electric devices with the electric current when no current at home.

B What's meant by ..... ?

1. Chemical reaction.
2. Natural radioactivity.

C Give reasons for :

1. A gas evolves on putting a piece of aluminium in diluted hydrochloric acid.
2. Food preservation in the freezer of the refrigerator.
3. When a pure yellow pod pea plant crossed with a pure green pod, the whole produced individuals were green pods.

Additional questions

Choose the correct answer :

1. Sodium bicarbonate is used in polishing silver by using a piece of ..... during washing.
   a. copper foil b. zinc foil c. aluminium foil d. chrome foil
2. Glucagon hormone is secreted by .....
   a. pituitary gland. b. thyroid gland. c. adrenal gland. d. pancreas gland.
3. ..... element shares in composing thyroxin hormone.
   a. Iodine b. Iron c. Sodium d. No correct answer

7 El-Gharbia Governorate

Answer the following questions :

Question 1

A Complete the following statements :

1. ..... gas turbids the clear limewater.
2. The curly hair trait dominates over the straight hair trait is follows the principle of ..... in human being.
3. Some reactions are very slow and need several months to take place, such as the formation of .....
4. The ..... project is interested in the effect of the various mutations on the function of the genes.
5. The electric current produced from electrochemical cells (batteries) is known as the ..... current.

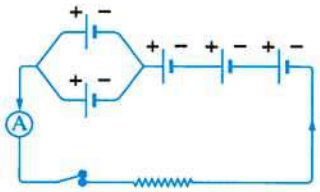
PART 3

B Give reasons for :

1. Copper does not react with diluted hydrochloric acid.
2. Radium is considered as a radioactive element.
3. In Mendel's experiment to study the seed colour of pea plant, he removed the stamens of their flowers before the anther becomes mature.

C In the opposite electric circuit :

If the e.m.f. for each cell equals 1.5 volt,
and the value of the resistance equals 3 ohm,
when the circuit is closed, calculate :



1. The e.m.f. of the battery.
2. The reading of the ammeter.

Question 2

A Choose the correct answer :

1. The recessive trait appears on the individuals when they receive from their parents .....
   a. two dominant genes. b. one recessive gene.
   c. two recessive genes. d. one dominant gene and one recessive gene.
2. To control the value of the current intensity that passes in the different parts of the circuit, we use the ..... instrument.
   a. ammeter b. voltmeter c. ohmmeter d. rheostat
3. When magnesium substitutes copper in copper salt solutions, the colour of the precipitate is .....
   a. black. b. red. c. blue. d. green.
4. The two hereditary factors that control the trait are similar if the trait is pure, and the living organism is called .....
   a. pure. b. hybrid. c. recessive. d. hybrid recessive.
5. At the start of the chemical reaction, the ratio of the concentration of the reactants is .....
   a. 100% b. 75% c. 50% d. 25%

B Mention only one use for each of the following :

1. The alternating electric current.
2. The uncut electric charger device.
3. The nuclear energy in the agricultural field.

C Use the following symbols to show the results of the mixed pollination between two pea plants, where one carries two pure dominant traits, tall stem and red flowers (TTRR) and the other carries two recessive traits, short stem and white flowers (ttrr) (The first generation only).

Question 3

A Write the scientific term for each of the following :

1. The changes that appear on a living organism as a result of exposure to radiation.
2. An enzyme that is found in sweet potato and helps in decomposition of hydrogen peroxide.
3. The state of an electric conductor that shows the transfer of the electricity from or to it, when it is connected to another conductor.
4. A substance changes the rate of the chemical reaction without being changed.
5. It is chemically consisted of a nucleic acid called DNA binds with protein.

B Compare between each of the following :

1. The hereditary traits and the acquired traits (in terms of definition).
2. The ammeter and the voltmeter (in terms of the way of connection in the electric circuit).
3. The oxidizing agent and the reducing agent (in terms of the concept).

C Illustrate by balanced symbolic equations the following reactions :

1. The reaction between hydrochloric acid and sodium hydroxide.
2. The effect of heat on sodium nitrate.

Question 4

A Correct the underlined words in the following sentences :

1. The electric generator (dynamo) converts **sound** energy into electric energy.
2. The mixed pollination between pea plants with pure yellow seeds and pea plants with pure green seeds, produces pea plants with **pure green** seeds.
3. The rate of a chemical reaction increases when the temperature of the reaction is **constant**.
4. Mendel chose **ten** main traits of pea plants to conduct his experiments.
5. When adding silver nitrate solution to sodium chloride solution, a **red** precipitate of silver chloride is formed.

B What happens in the following cases ..... ?

1. The gene cannot give its special enzyme.
2. Passing of hydrogen gas through a hot copper oxide.
3. Replacing a piece of iron with iron filings of the same mass when reacting with the same volume of diluted acids.

C Calculate the current intensity due to the flow of 4500 coulomb through a cross-section of a conductor for 5 minutes.

Additional questions

A Write a short note about the uses of sodium bicarbonate in the garden and in the home.

B Mention the importance of the air bags.

PART 3

8 El-Dakahlia Governorate

Answer the following questions :

Question 1

A Choose the correct answer :

1. The reaction in which double substitution occurs between the ions of two compounds to form two other new compounds is called ..... reaction.
   a. double substitution b. simple substitution
   c. neutralization d. oxidation and reduction
2. The factor that affects the rate of the chemical reaction without itself being changed is the .....
   a. concentration of reactants. b. surface area of reactants.
   c. catalyst. d. temperature.
3. To generate an alternating current, we use the .....
   a. dynamo. b. dry cell. c. dry battery. d. all of the previous answers.
4. Mendel chose the garden pea plant to conduct his researches for these reasons except one of them, ...
   a. it is easy to be planted the pea plant. b. it can self-pollinate.
   c. it can easily be artificially pollinated. d. its life cycle is long.
5. ..... consists of nucleic acid DNA joined with protein.
   a. The gene b. The thymine c. The chromosome d. The cytoplasm

B Show by an experiment :

The surface area of reactants affects the speed of chemical reaction (write the steps only).

C A quantity of charge 360 coulomb passes in a conductor through time of one hour, calculate the electric voltage for the electric source if the resistance of the conductor is 2200 ohm.

Question 2

A Complete the following sentences :

1. $Na^+Cl^- + Ag^+$ ..... ⟶ ..... + $Na^+NO_3^-$
2. The reaction between an acid and an alkali is called ..... reaction, while decompose the compounds by heat into its simple components is called ..... reaction.
3. Volt is the potential difference between terminals of a conductor when work done of ..... to transmit a quantity of charge of ..... between them.

4. Electric current produced from dry cell is due to change ..... energy to ..... energy.
5. The scientists ..... and ..... discovered the means of how the gene controls the appearance of a trait.

B Compare between :

Dominant traits and recessive traits.

C You have three electric cells, the electromotive force of each cell is 3 volt, show by drawing only how you connect them to obtain electromotive force of :

(1) 3 volts. (2) 6 volts. (3) 9 volts.

Question 3

A Write the scientific term :

1. A chemical process which causes the decrease in the hydrogen percentage in the substance.
2. It is the arrangement of the metals in a descending order according to the degree of their chemical activity where the element which is more active substitutes the less active one.
3. The quantity of electric charges in coulomb flowing through a cross-section of the conductor in one second.
4. The nuclear energy that is released during nuclear reactions done by the scientists that can be controlled or that cannot be controlled.
5. The change in the concentration of the reactants and resultants at a unit time.

B Mention the types of the electric resistance and draw their symbols in the electric circuit

C If you know that the free ear lobe (Y) is dominant trait, while attached ear lobe (y) is recessive trait. Explain on genetic bases the traits of the offspring resulted from the crossing between man and woman both of them is hybrid for these traits (Yy).

Question 4

A Give reasons for :

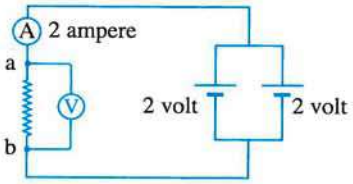
1. When red mercuric oxide is heated, a silvery precipitate is formed.
2. Speed of chemical reaction increases with rise in temperature.
3. Mendel's first law is called the law of segregation of factors.
4. Some of electric circuits contain rheostat.

B What will happen ... ?

1. When heating blue copper hydroxide.
2. If you put a small piece of sodium to flask contains water.

PART 3

C From the opposite circuit, find the work done required to transfer a quantity of electric charge between points (a) and (b) through 5 minutes if the electromotive force of each cell is two volt and the reading of ammeter is two ampere.



Additional questions

A Complete the following equation :

$2NaN_3 \xrightarrow[\text{Spark}]{\text{Electric}}$ ..... + ...

B Mention the role or the function of each of the following :

1. Hormones.
2. Endocrine glands.
3. Iodine salt.

9 Ismailia Governorate

Answer the following questions :

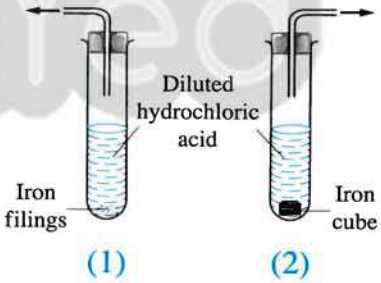
Question 1

A Complete the following statements with suitable words :

1. The current intensity is measured by using ....., but voltmeter is used for measuring the .....
2. The chromosome is chemically consisted of a nucleic acid called ..... binds with .....
3. $Cu(OH)_2 \xrightarrow{\Delta}$ ..... + ...

B From the opposite figures :

1. What is the kind of chemical reaction ?
2. Express this reaction with a balanced chemical equation.
3. What is the factor affecting the rate of the reaction ?
4. What happens on replacing iron by copper ? Why ?



Question 2

A Write the scientific term for each of the following statements :

1. The trait that appears in all individuals of the first generation in Mendel's experiments.
2. The flow of electric negative charges in a conducting substance.
3. The measuring unit of absorbed radiation.
4. The arrangement of metals in a descending order according to the degree of their chemical activity.
5. An enzyme found in sweet potato helps in decomposition of hydrogen peroxide.

B **Calculate the quantity of electricity passing in a conductor of a resistance 2200 ohm for two minutes if the potential difference between its terminals equals 220 volt.**

C **Compare between :**

The electric current represented by each figure according to the kind.

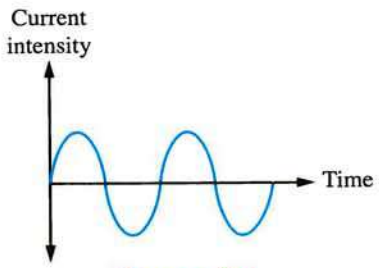


Figure (1)

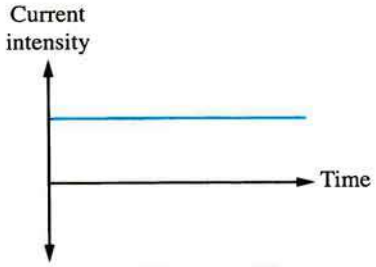


Figure (2)

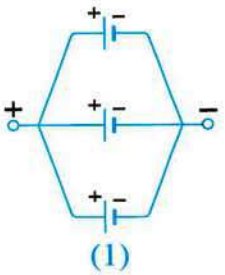
Question 3

A **Choose the correct answer :**

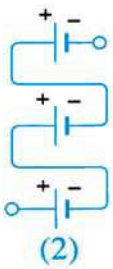
1. Ohmmeter is used in measuring the .....
   a. potential difference. b. current intensity.
   c. electric resistance. d. quantity of electricity.
2. From the non-radioactive elements is .....
   a. radium. b. uranium. c. iron. d. cesium.
3. If a pollination is happened between two individuals, each of them is hybrid, the product is 200 individuals, so the number of hybrid individuals is likely to be ..... individual.
   a. 50 b. 100 c. 150 d. 200
4. When dry hydrogen passes on hot black copper oxide, ... occur(s).
   a. oxidation b. reduction
   c. oxidation and reduction d. no correct answer
5. The recessive trait appears on one of the offspring if it was inherited from parents .....
   a. two dominant genes. b. one dominant gene.
   c. two recessive genes. d. a dominant gene and a recessive gene.
6. At the start of the reaction, the concentration of reactants is .....
   a. 100% b. zero % c. 50% d. 25%

B **From the two opposite figures :**

Which figure gives higher voltmeter reading, when the voltmeter is connected with battery (1) or when it is connected with battery (2) ? Why ?
(Given that all the cells are similar)



(1)



(2)

C **Mention one function for the following :**

1. The electric transformer.
2. The nuclear energy in the medical field.

PART 3

Question 4

A Correct the underlined words :

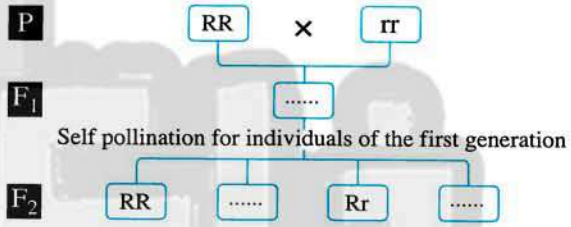
1. Most of metal carbonates decompose when heated into **metal** and carbon dioxide.
2. The unit of measuring the electric charges is **volt**.
3. The electric current intensity passing in a conductor is directly proportional to the **resistance** at constant temperature.
4. Mendel's second law is called the law of **segregation of factors**.

B Give reasons for :

1. Preserving food in the freezer of the refrigerator.
2. Red precipitate is formed on adding a piece of magnesium to copper sulphate solution (Write the chemical equation of the reaction with your answer).

C The opposite figure illustrates a cross-pollination : between a pea plant with red flowers and another pea plant with white flowers :

1. Determine by symbols the individuals of the first generation.
2. Fill in gabs the second generation.
3. Is the results verify Mendel's first law ? State your reason.



Additional questions

What would happen ..... ?

1. When the glands that secrete hormones have ducts.
2. If the secretion of growth hormone is increased at childhood.
3. To the human when thyroxin hormone secretion increases.

10 Port Said Governorate

Answer the following questions :

Question 1

A Write the scientific term for each of the following statements :

1. They are parts of DNA present on the chromosomes and control the hereditary traits of the individual.
2. The breaking up of bonds in reactants molecules and formation of new bonds in the products molecules.

3. The state of an electric conductor that shows the transfer of the electricity from or to it, when it is connected to another conductor.
4. A substance which increases the rate of chemical reaction without sharing in the reaction.
5. A science that researches the transmission of the hereditary traits from one generation to another.

B Give reasons for :

1. Gold does not react with acids.
2. When a yellow pod pea plant is pollinated with a pure green pod pea plant, they produce plants that are all with green pods.
3. It is better to use the alternating current rather than the direct current.

C Calculate the quantity of electric charges passing through a conductor for two minutes, if the value of its resistance is 2200 ohm, and it is connected to a source of electric current its potential difference is 220 volt.

Question 2

A Complete each of the following :

1. At the beginning of the chemical reaction, the concentration of reactants is ..... %
2. Garden pea plant can be easily .....
3. On connecting two charged conductors, the electric current passes from the conductor with ..... potential to the conductor with ..... potential.
4. Zinc reacts with diluted hydrochloric acid forming a salt called .....

B Mention the efforts (discoveries) of each of the following scientists :

1. Ohm.
2. Watson and Crick.
3. Henri Becquerel.
4. Badel and Tatum.

C Illustrate by balanced symbolic equations each of the following reactions :

1. Neutralization reaction.
2. Oxidation-reduction reaction.

Question 3

A Rewrite the following statements after correcting the underlined words :

1. **Acquired** traits are transmitted from one generation to another.
2. **Magnetic** energy converts into electric energy in dry cells.
3. Most metal carbonates decompose by heat into **metal** and carbon dioxide.
4. The electric current intensity is **inversely** proportional to the potential difference.
5. The unit of measuring the electromotive force (e.m.f.) is the **coulomb**.

B Explain an activity to discover the effect of temperature on the rate of chemical reactions.

PART 3

C Use the symbols (Tt) to express the results of the pollination between two hybrid (heterozygous) tall stem pea plants with each other.

Question 4

A Choose the correct answer :

1. When magnesium substitutes copper in one of its salt solutions, a ..... precipitate is formed.
   a. black b. red c. white
2. The sliding rheostat is used in the electric circuit to .....
   a. measure current intensity.
   b. measure potential difference
   c. change (control) the value of the electric resistance.
3. The two factors of every hereditary trait are similar if the trait is .....
   a. homozygous. b. hybrid. c. recessive and hybrid.
4. An instrument known as the ..... is used to measure the electric resistance.
   a. ammeter b. ohmmeter c. voltmeter

B Compare between :

1. Ionic compounds and covalent compounds. [In terms of the speed of their reactions]
2. The dominant trait and the recessive trait. [In terms of their definition]

C Show by a diagram how to connect three electric cells :

1. In parallel. 2. In series.

Additional questions

A Complete the following sentences :

1. The most modern cars are equipped with ..... which helps in treatment of harmful gases emitted from the car engine.
2. The ..... hormone promotes the growth of endometrium.

B Mention the idea of operation of the air bags.

11 Suez Governorate

Answer the following questions :

Question 1

A Choose the correct answer :

1. The scientist ..... is the founder of heredity.
   a. Mendel b. Ohm c. Becquerel d. Watson

2. ..... is a non-radioactive element.
   a. Radium b. Uranium c. Iron d. Cesium
3. To generate an alternating electric current, we use the .....
   a. rheostat. b. dynamo. c. ammeter. d. ohmmeter.
4. The parts of DNA present on the chromosomes and control the hereditary traits of the individual is/are .....
   a. genes. b. gametes. c. cytoplasm. d. (b) and (c) together.

B Illustrate by balanced chemical equations each of the following reactions :

1. Adding silver nitrate solution to sodium chloride solution.
2. The effect of heat on copper sulphate.

C Mention the importance of the following :

1. The sliding rheostat.
2. A catalyst on a chemical reaction.

Question 2

A Correct the underlined words in the following statements :

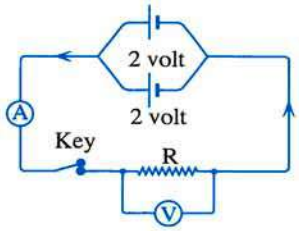
1. Most metal carbonates decompose on being heated into **metal** and carbon dioxide.
2. The reactions of ionic compounds are **slower** than that of the covalent compounds.
3. Every gene gives a special **hormone** responsible for the occurrence of a reaction resulting in a protein showing a hereditary trait.
4. In the electric cell, **magnetic** energy is converted into electric energy.

B Give reasons for :

1. Magnesium replaces hydrogen of the acids.
2. Alternating current is preferred than the direct one.
3. The ability of rolling the tongue is a dominant trait in the human being.

C In the opposite figure :

If a quantity of electricity which passes in the electric circuit through 60 second is 30 coulomb. Find :



1. The ammeter reading (A).
2. The voltmeter reading (V).
3. The value of the resistance (R).

Question 3

A Complete each of the following sentences :

1. The ..... is the substance which gives oxygen and takes away hydrogen.
2. At the beginning of the chemical reaction, the concentration of reactants is ..... %.

PART 3

3. The ..... is used to measure the electromotive force of a battery.
4. Chromosome is chemically composed of a nucleic acid called DNA which is combined with .....

B What happens when ... ?

1. Increasing the temperature of chemical reaction.
2. Two charged conductors of different electric potential are touched.
3. Exposure of the human body to a large dosage of radiation for a short time.

C Use the symbols to express the mating between two pea plants, one of them is hybrid red flowers and the other is white flowers.
[Knowing that the symbol of the dominant gene is (R) and the recessive gene is (r)]

Question 4

A Write the scientific term for each of the following sentences :

1. The unit that is used to measure the absorbed radiation.
2. Reaction of an acid and a base to give salt and water.
3. The trait that appears in all individuals of the first generation in Mendel's experiments.

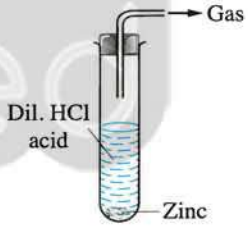
B Compare between each of the following :

1. The inherited (hereditary) traits and the acquired traits [according to : the definition].
2. Ammeter and voltmeter [according to : the way of connection in the electric circuit].

C In the opposite figure :

On adding diluted hydrochloric acid to zinc, a gas is evolved.

1. What is the name of the evolved gas ?
2. What do you observe if zinc is replaced by copper ?



Additional questions

Write the scientific term for each of the following sentences :

1. Organs secrete hormones directly into blood stream.
2. A chemical message that controls and regulates the activities and functions of most of the body.
3. They are considered one of the most important safety means in cars at emergencies.
4. The substance that is used in polishing silver or any decorative metal pieces made of copper or chrome.

12 Damietta Governorate

Answer the following questions :

Question 1

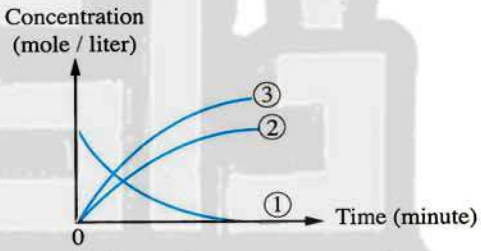
A Complete the following statements :

1. The ..... current can be transferred for short distances only, while the ..... current can be transferred for short and long distances.
2. Radioactive wastes should be buried away from ..... path and areas may be exposed to .....
3. The skill of swimming is one of the ..... traits, while blood group is one of the ..... traits.
4. The ..... apparatus is used to store the electric energy, while the .....apparatus is used to measure the electromotive force.
5. $NaCl + AgNO_3 \longrightarrow$ ..... + ...

B The opposite graph represents the rate of rapid decomposition of (X) compound as in the following equation :

$2X \longrightarrow 2Y + Z$

Replace the numbers on the figure by suitable substance (X , Y , Z) from the equation.



C What are the results of ... ?

1. The length of rheostat wire increases in the electric circuit (related to the electric current intensity).
2. Changing the chemical composition of blood hemoglobin.

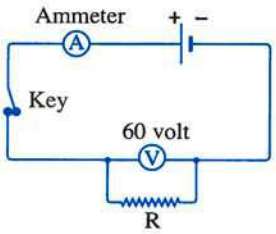
Question 2

A Write the scientific term for each of the following statements :

1. A substance which speeds up the chemical reaction without changing.
2. Chemically it consists of a nucleic acid combined with protein.
3. Cells by which the chemical energy is converted into electric energy.
4. The process of spontaneous decaying of atoms nuclei of some elements present in nature to reach a more stable composition.
5. The force that is needed to bind the nucleus components together and to overcome the repulsion force between the positively charged protons.

PART 3

B Calculate the electric current intensity passing in the opposite electric circuit, if the work done to transfer the electric charge is 540 joule and time of flowing is 3 second.



C Give reasons for :

1. The fridge is used to preserve food.
2. The exposure to radiation has genetic effects.

Question 3

A Choose the correct answer :

1. The mathematical relation of Ohm's law is .....
   a. $R = \frac{V}{I}$ b. $R = \frac{I}{V}$ c. $I = \frac{R}{V}$ d. $V = \frac{I}{R}$
2. All of the following are factors affecting the rate of chemical reaction except .....
   a. the concentration of reactants. b. the nature of reactants.
   c. the nature of products. d. the temperature of the reaction.
3. In human being, there are dominant traits, from which .....
   a. smooth hair. b. attached ear lobe. c. narrow eyes. d. absence of freckles
4. The radioactivity phenomenon was discovered by the scientist .....
   a. Ohm. b. Henri Becquerel. c. Mendel. d. Watson.
5. The genetically modified rice contains .....
   a. folic acid. b. vitamin (A). c. carotene. d. melanin.

B If you have four electric cells, the electromotive force of each is 2 volt :

Show by drawing only, how can you connect them to obtain a battery of an electromotive force of 4 volt with three different ways.

C Compare between oxidation and reduction processes including :

- Traditional concept. - Electronic concept.

Question 4

A Rewrite the following statements after correcting the underlined words :

1. Dynamo converts the **chemical** energy to electric energy.
2. The measuring unit of the absorbed radiation is the **coulomb**.
3. Mendel removed the **petals** of pea plant flowers to insure that the plant does not self pollinate.
4. **The electric current intensity** is the state of an electric conductor that shows the transfer of electricity from or to it when it is connected to another conductor.
5. The ratio of gametes TR in a plant whose genetic structure TtRr is **75%**.

B Choose from columns (B) and (C) what suit with column (A), then write the complete statements :

(A) The reaction	(B) Gas produced	(C) Type of reaction
1. Zinc with dil. hydrochloric acid.	A. SO_3 ↑	a. Precipitation reaction.
2. Heating copper sulphate.	B. CO_2 ↑	b. Simple substitution.
3. Sodium carbonate with hydrochloric acid.	C. O_2 ↑	c. Thermal decomposition.
	D. H_2 ↑	d. Double substitution.
		e. Direct combination.

C Explain on genetic bases :

The traits of the individuals resulted from mating hybrid black male mouse with hybrid black female mouse. If the black colour gene (B) dominates over the brown colour gene (b).

Additional questions

Choose the correct answer :

1. The ceramic cells in the catalytic converter leads to .....
   a. increasing the surface area exposed to the reaction.
   b. increasing the concentration of the reactants.
   c. increasing the temperature.
   d. no correct answer.
2. The ..... is the only way for hormones to reach their sites of action.
   a. enzyme b. lymph c. blood d. duct
3. Man suffers from ..... disease when his food lacks of iodine.
   a. dwarfism b. diabetes c. gigantism d. simple goiter

13 Kafr El-Sheikh Governorate

Answer the following questions :

Question 1

A Write the scientific term for each of the following statements :

1. The scientists who made a model for the DNA molecule.
2. A substance which slows down the speed of chemical reaction and does not change during the reaction.
3. The state of an electric conductor that shows the transfer of the electricity from or to it when it is connected to another conductor.
4. The process of spontaneous decaying of atoms of some elements that are present in nature to reach a more stability.

PART 3

B Compare between :

Alternating electric current and direct electric current (in view of uses).

C Write the balanced chemical equations of the following reactions :

1. Reaction between hydrochloric acid with sodium carbonate.
2. Heating of red mercuric oxide.

Question 2

A Choose the correct answer :

1. The substance which loses one electron or more during the chemical reaction is named .....

   a. catalyst. b. reducing agent. c. oxidizing agent. d. enzyme.

2. The ohmmeter is used to measure the ..... in the electric circuit.

   a. potential difference b. resistance

   c. current intensity d. quantity of electricity

3. ..... is a radioactive element.

   a. Calcium b. Radium c. Iron d. Barium

4. The first person who started the scientific study of heredity through experiments is .....

   a. Ohm. b. Watson. c. Mendel. d. Wohler.

B What happens when .... ?

1. Exposure of human body cells to small dosage of radiation for a long period of time.
2. Increasing the quantity of electricity which flows through a cross-section of the conductor in one second.

C What is the type of ..... ?

1. Process : $Ag^{+1} + e^{-} \longrightarrow Ag$
2. The reaction between an acid and an alkali to form salt and water.

Question 3

A Give reasons for :

1. Polonium is a radioactive element.
2. Electric current will not flow between two charged conductors have the same electric potential.

B Calculate the current intensity due to the flow of 5400 coulomb through a cross-section of a conductor for 5 minutes.

C Complete the following statements :

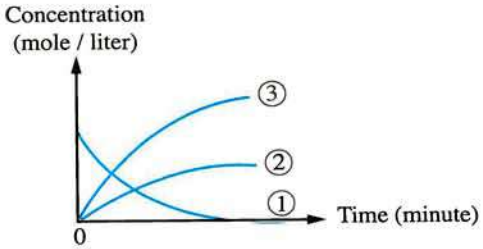
1. The measuring unit of quantity of charge is the .....
2. The measuring unit of absorbed radiation is the .....
3. The two factors of hereditary trait are not similar in the ..... individual.

Question 4

A The following equation represents decomposition of (N_2O_5) compound

$$2N_2O_5 \longrightarrow 4NO_2 + O_2$$

The opposite graph illustrates the change in the concentration of reactants and resultants in respect to time. Write the name of the element or the compound to which each number refers.



B Use the following symbols to express the results of mating between pure yellow seeds pea plant (CC) with pure green seeds pea plant (cc) (explain your answer on genetic bases).

C Rewrite the following statements after correcting the underlined words :

1. The **ammeter** is used in changing resistance.
2. The radioactivity was known for the first time by the scientist **Ohm**.
3. First law of Mendel is named the law of **independent assortment of the hereditary factors**.
4. Most metal carbonates decompose on being heated into **metal** and carbon dioxide.

Additional questions

A Write the scientific term for each of the following :

1. The hormone which controls the level of calcium in the blood.
2. The hormone that stimulates body organs to respond to emergencies.
3. The element that enters in the composition of thyroxin hormone.

B Choose the correct answer :

Sodium bicarbonate is used in polishing silver by using a piece of ..... during washing.

a. copper foil b. zinc foil c. aluminium foil d. chrome foil

14 El-Behira Governorate

Answer the following questions :

Question 1

A Choose the correct answer :

1. On heating copper sulphate, a ..... precipitate is formed.

a. black b. green c. blue d. red

PART 3

2. ..... increase the number of collisions between molecules and consequently the speed of chemical reaction increases.
   a. Increasing the reaction temperature b. Adding a catalyst
   c. Increasing the reactants concentration d. Both (a) and (c)
3. ..... is a non-radioactive element.
   a. Radium b. Uranium c. Iron d. Zirconium
4. Mendel has covered ..... of the pistils in order not to cross pollinate from other flowers.
   a. stamens b. stigmas c. sepals d. petals
5. If an electric current whose intensity is one ampere passes through a resistance of 20 ohm, then the intensity of the electric current increases to 2 ampere in the same resistance, so the value of resistance .....
   a. increases to double. b. decreases to half.
   c. decreases to quarter. d. does not change.

B What happens ...?

1. When two electrically charged conductors touch, where the electric potential of the first conductor is higher than the electric potential of the second conductor.
2. When adding silver nitrate solution to sodium chloride solution.
3. If the resistance used in verifying Ohm's law is burnt related to the ammeter and voltmeter readings.

C Illustrate by an experiment the effect of the surface area on the speed of the chemical reaction using the following table :

Procedures	Observation	Conclusion
		The speed of chemical reaction increases by increasing the surface area of the reactants exposed to reaction.

Question 2

A Write the scientific term for each of the following :

1. The flow of electric negative charges in a conducting material.
2. A physical quantity which is measured by (volt × coulomb).
3. The traits that are not transmitted from one generation to another.
4. The individual who carries a similar pair of genes either dominant or recessive.

B Study the following reactions, then answer :

$\boxed{A} \xrightarrow{\Delta\ ①} H_2O + CuO$

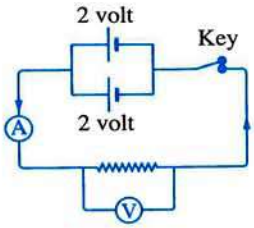
$2Na + 2H_2O \xrightarrow{②} 2NaOH + \boxed{B}$

$CuO + \boxed{B} \xrightarrow{\Delta\ ③} H_2O + \boxed{C}$

1. Write the chemical formula for A, B and C.
2. What is the type of chemical reactions ① , ② & ③ ?
3. What is the name of the process that happens to black copper oxide? And why ?

C In the opposite circuit :

If the quantity of electricity which passes through the electric circuit in a time 40 second is 20 coulomb. Find :



1. The ammeter reading.
2. The voltmeter reading.
3. The value of resistance.

Question 3

A Complete the following sentences :

1. The resistance is measured by using ..... and has a measuring unit known as .....
2. The ....., genetic and ..... effects are due to exposure to a small dosage of radiation for a long time.
3. The reaction between acid and alkali gives ..... and .....
4. During the chemical reaction, the concentration of the reactants ..... gradually, while the concentration of the resultants ..... gradually.
5. The ..... project discovered that more than ..... % of the DNA is similar in humans.

B Mention each of the following :

1. Common factors of catalysts. (only two)
2. State the contributions of the scientist Dr. Ali Mostafa Mosharafa in the field of atom.
3. The scientific idea of producing rice that contains carotene.

C When male and female fruit flies, both have long wings were crossed. The output was (27) have long wings and (9) have short wings. Explain the results on genetic bases when the long wing gene is (T) and the short wing gene is (t).

Question 4

A Give reasons for :

1. It is better to use the alternating current rather than the direct current.
2. Copper does not react with diluted acids.
3. Reactions between ionic compounds are fast whereas, reactions between covalent compounds are slow.

PART 3

B The following table represents the relation between the electromotive force (e.m.f.) of a group of electric cells and the number of this electric cells.

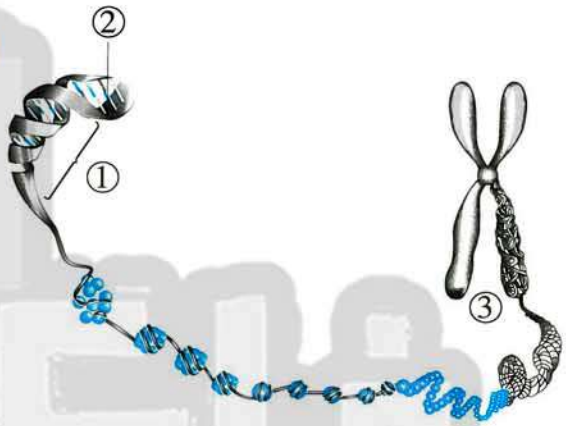
The number of electric cells	1	2	3	4	5
The e.m.f. (Volt)	1.5	3	4.5	6	7.5

Answer the following :

1. Draw a graphical relation between the e.m.f. on Y-axis and the number of electric cells on X-axis.
2. From the graph find the electromotive force of one cell.
3. What is the type of connection of cells ?

C First : Study the opposite figure, then answer :

1. Give the name of ① , ② & ③.
2. Mention the name of the structural units of number ①.
3. Mention the name of chemical structure of number ③.



Second : Mention two reasons for choosing Mendel the pea plant to conduct his experiments.

Additional questions

A Write the uses of sodium bicarbonate in the garden.

B Write the scientific term for each of the following :

1. A metallic can exists in most modern cars to treat the harmful gases emitted from the car engine.
2. The element that enters in the composition of thyroxin hormone.

15 El-Fayoum Governorate

Answer the following questions :

Question 1

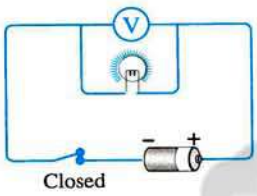
A Complete the following sentences :

1. The ..... is used to measure the electric resistance.
2. From very slow reactions which need several months is .....
3. The pea plant is easy to ..... and its life cycle is .....
4. The speed of chemical reaction can be practically measured by the rate of ..... of reactants or the rate of ..... of resultants.

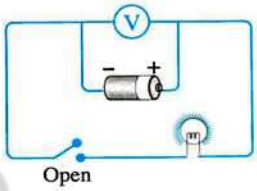
B What would happen in each of the following .... ?

1. The length of the rheostat wire increases in the electric circuit (related to the electric current intensity).
2. The gene cannot produce its special enzyme.

C What is the importance of voltmeter in the two circuits (first is closed and second is opened) :



First circuit



Second circuit

Question 2

A Choose the correct answer :

1. One of the properties of the direct current that it is .....
   a. changable value. b. changable direction. c. constant value and direction.
2. The rate of breaking up of hydrogen peroxide increases by the addition of .....
   a. manganese oxide. b. magnesium oxide. c. manganese dioxide.
3. According to Mendel's first law, the hereditary factors ..... when gametes are formed.
   a. combine b. segregate c. disappear
4. The speed of most chemical reactions is ..... by rising temperature.
   a. increased b. decreased c. not affected

B Give reasons for :

1. The occurrence of effervescence on putting a piece of aluminium in diluted hydrochloric acid.
2. The wide eyes trait dominates over the narrow eyes trait in human.
3. The electric charges transfer from a charged conductor to another charged conductor.
4. The rate of the reaction of hydrochloric acid with iron filings is faster than a piece of iron has the same mass.

C If an electric current of (20) ampere passes in an electric heater and the potential difference between its two ends is (220) volt, calculate the heater's resistance.

Question 3

A Define the following :

1. Catalyst. 2. Ohm's law. 3. Acquired traits. 4. Radioactive elements

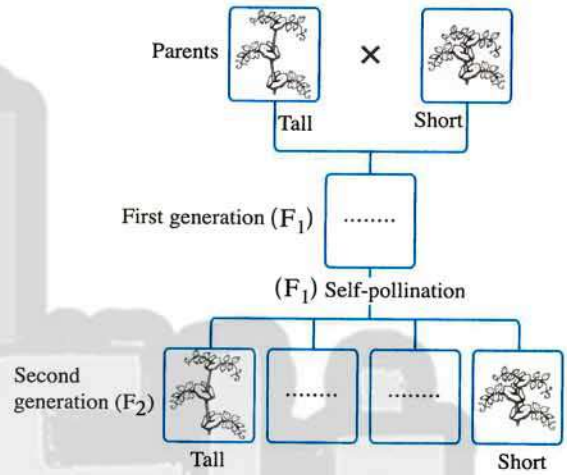
PART 3

B Write the scientific term for each of the following statements :

1. The quantity of the electric charges flowing through a cross-section of the conductor in one second.
2. The breaking up of bonds in the reactants molecules and formation of new bonds in the products molecules.
3. It is found in nucleus and carried the genetic material, which is chemically consisted of a nucleic acid called DNA binds with protein.
4. The measuring unit of absorbed radiation.

C The opposite figure illustrates the mixed pollination between two pea plants, one of short stem and another of tall stem, determine :

1. The individuals of the first generation.
2. Complete the missing individuals of the second generation and describe them.



Question 4

A Correct the underlined words in the following statements :

1. The ammeter connected in **parallel** in an electric circuit.
2. The scientist **Mendeleev** is the founder of heredity.
3. Sodium is monovalent because it **gains** one electron.
4. **Electron** is considered an energy store in the atom.

B Compare between each pair of the following :

1. Ionic compounds and covalent compounds (one difference).
2. Pure individual and hybrid (impure) individual (according to : definition).

C Complete the following equations :

1. $Cu(OH)_2 \xrightarrow{\Delta}$ ..... + ...
2. $NaCl + AgNO_3 \longrightarrow$ ..... + ...

Additional questions

Complete the following sentences :

1. Endocrine glands secrete more than ..... hormones in the human body.
2. On reaching adulthood stage, ... glands are activated by hormones secreted from pituitary gland.
3. Pancreas is located between the ..... and .....
4. ..... are considered one of the most important safety means in cars at emergencies.

16 Beni Sueif Governorate

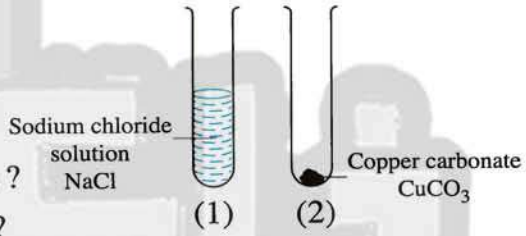
Answer the following questions :

Question 1

A Complete the following sentences :

1. The scientist Henri Becquerel discovered ..... phenomenon.
2. The mechanical energy can be converted into electric energy by .....
3. The science that researches the transmission of hereditary traits from one generation to another is .....
4. ..... energy is used in the medical field to diagnose and treat some diseases like cancer.
5. Sodium chloride powder reacts ..... than a cube of sodium chloride of the same mass.

B In the opposite figures, silver nitrate solution ($AgNO_3$) was added to tube (1) and the tube (2) is heated :



1. What is the colour of the precipitate in the tube (1) ?
2. How could we test the evolved gas in the tube (2) ?
3. Write the chemical equation of the reaction in the tube (2).

C Using symbols to express the results of mating between pure green seeds of pea plant (yy) with another pure yellow seeds (YY). Showing parents, gametes and first generation.

Question 2

A Choose the correct answer :

1. The rate of chemical reaction is increased by rising temperature due to the increase of the .....
   a. surface area exposed to reaction. b. number of molecules.
   c. probable collisions between molecules. d. reactants concentration.
2. Mendel removed the stamens of plant flowers before the anther becomes mature to prevent .....
   a. self pollination. b. cross pollination.
   c. artificial pollination. d. cross and artificial pollination together.
3. All of the following units are used to measure the electric current intensity except .....
   a. ampere. b. coulomb/second. c. joule/coulomb. d. volt/ohm.

PART 3

4. According to Mendel's second law, the dominant trait appears in the second generation at a ratio of .....

a. 25 % b. 50 % c. 75 % d. 100 %

5. From the recessive traits which Mendel studied is .....

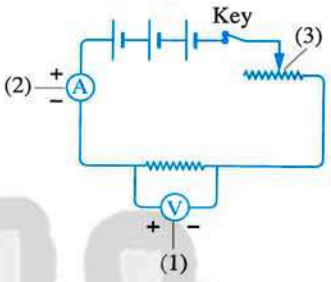
a. tall stem. b. short stem. c. red flower colour. d. smooth seed shape.

B In the following reaction :

Hydrogen + Copper oxide $\xrightarrow{\text{Heat}}$ Water + Copper

1. Why copper oxide is considered as an oxidizing agent ?
2. What is the name of the process that occurred to hydrogen gas ?
3. Write the chemical equation that expresses the previous reaction.

C From the opposite electric circuit, name the digits that are referring to :



1. The device that is used to control the electric current intensity.
2. The device which is connected in the electric circuit in parallel.

Question 3

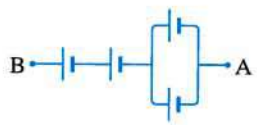
A Write the scientific term for each of the following statements :

1. The breaking up of bonds in the reactants molecules and formation of new bonds in the products molecules.
2. It is the potential difference between the terminals of a conductor on doing a work of one joule to transfer a quantity of charge of one coulomb.
3. They are parts of DNA present on the chromosomes and control the hereditary traits of the individual.
4. The descending arrangement of metals according to the degree of their chemical activity.
5. Traits which are not transmitted from one generation to another.

B Give reasons for :

1. Mendel selecting pea plant to conduct his experiments.
2. The radioactive wastes should be away from underground water path.
3. Magnesium element replaces copper element in copper sulphate solution (write the balanced equation).

C The opposite figure represents a battery contains four similar cells, the (e.m.f.) for each is 2 volt :



1. Calculate the e.m.f. between point (A) and point (B).
2. By drawing only show how to connect the electric cells of the battery to get a maximum e.m.f.

Question 4

A Correct the underlined words in the following statements :

1. The change in the **volume** of the reactants and resultants at a unit time is known as the speed of chemical reaction.
2. Some metals react with water to produce metal **oxide** and hydrogen gas is evolved.
3. **Alternating** electric current used in electroplating process.
4. The two hereditary factors are similar in **hybrid** individual.
5. The **attached** ear lobe is from dominant traits in the human.

B What would happen in the following cases ..... ?

1. Adding manganese dioxide powder to hydrogen peroxide solution.
2. Man is exposed to large doses of radiation for a short period of time.
3. The gene failed in the production of its special enzyme.

C Calculate the resistance of an electric heater that allows passing of 0.2 ampere of electric current intensity through and its potential difference between its terminals is 220 volt. (Write the law used)

Additional questions

A Choose the correct answer :

1. The ..... hormone liberates the needed energy from the food stuff.
   a. growth b. estrogen c. thyroxin d. testosterone
2. The disorder resulted from the increase of thyroxin hormone secretion in large amounts is the .....
   a. exophthalmic goiter. b. simple goiter. c. diabetes. d. dwarfism.
3. Insulin hormone stimulates body cells to ..... glucose sugar from the blood.
   a. absorb b. hydrolyce c. decompose d. breakdown

B Complete the following equation :

..... $\xrightarrow{\text{.....}}$ $2Na + 3N_2\uparrow$

17 El-Menia Governorate

Answer the following questions :

Question 1

A Choose the correct answer :

1. Sodium metal can replace all of the following metals in their salt solutions except .....
   a. copper. b. potassium. c. magnesium. d. zinc.

PART 3

2. The ..... is used to measure the electric resistance.

a. ammeter b. voltmeter c. ohmmeter d. rheostat

3. The two factors of a hereditary trait are similar in the ..... individual.

a. pure b. hybrid c. recessive d. pure and recessive

4. Human being should not be exposed to radiation in amount more than ..... rem in a day.

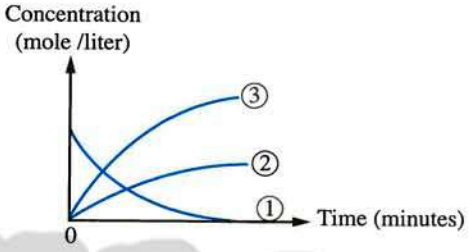
a. 5 b. 8 c. 10 d. 15

B Mention the physical quantity which is measured by the following units :

1. Joule/coulomb. 2. Coulomb/second.

C The opposite figure represents the breaking up of nitrogen pentoxide

1. Write the balanced symbolic equation of this reaction.
2. Replace the numbers on the figure by suitable substances from the equation.



Question 2

A Write the scientific term for each of the following :

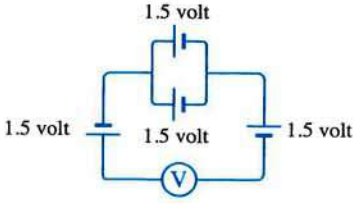
1. It is the state of the electric conductor which determines the transfer of electricity from or to the conductor.
2. The appearance of a dominant hereditary trait in the individuals of the first generation when two individuals are crossed, one of them carries a pure hereditary trait contrasting the trait carried by the other individual.
3. They are chemical substances produced by the body of the living organism, act as catalysts that increase the speed of biological reactions.
4. They are parts of DNA present on the chromosomes and control the individual's hereditary traits.

B Compare between :

1. Covalent compounds and ionic compounds. (according to : The speed of the reaction)
2. The direct current and the alternating current. (according to : The direction)
3. The black eyes and narrow eyes. (according to : The type of trait)

C In the opposite figure, complete the following :

1. The voltmeter reading = ... volt.
2. If all the columns connect on series, the voltmeter reading = ... volt.



Question 3

A Give reasons for :

1. A red precipitate is formed when magnesium is added to copper sulphate solution.
2. Learn to walk in children is not considered as a genetic trait.
3. Some people who depend mainly on eating rice have deficiency in vitamin (A).
4. Some elements are called radioactive elements.

B The following reaction represents concurrent processes, answer the following questions :

$$2CuO + C \xrightarrow{\Delta} 2Cu + CO_2$$

1. Copper oxide undergoes ..... process, and considered as ..... agent.
2. Carbon undergoes ..... process, and considered as ..... agent.

C Calculate the quantity of electricity that passes through a conductor of a resistance 2200 ohm for two minutes when it is connected with a source of electric potential 220 volt.

Question 4

A Rewrite the following statements after correcting the underlined words :

1. In the dry cell, the **magnetic** energy is changed into electric energy.
2. Mendel's second law is named by the law of **segregation of factors**.
3. Most metal carbonates are decomposed by heating into metal oxide and **nitrogen** gas.
4. When we add silver nitrate solution to sodium chloride solution, **a black** precipitate is formed.

B What is meant by each of the following ..... ?

1. Chemical reaction.
2. Nuclear binding energy.
3. The human genome project.

C Using symbols to express the results of mating between a long stemmed pea plant (TT) and a short stemmed pea plant (tt) in the first generation. Showing (parents – gametes – offspring).

Additional questions

A What is the importance of the air bags ?

B Write the scientific term :

1. A metallic can exists in most modern cars to treat the harmful gases emitted from the engine.
2. The substance that is used in polishing silver or any decorative metal pieces made of copper or chrome.
3. The disease caused by the increase in the secretion of thyroxin hormone.

PART 3

18 Assiut Governorate

Answer the following questions :

Question 1

A Complete the following statements :

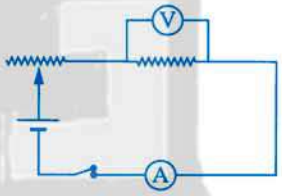
1. A reaction between an acid and an alkali to form salt and water is known as ..... reaction.
2. In the dry cell, ... energy is converted to electric energy.
3. Nitrogen pentoxide breaks up into nitrogen dioxide gas and .....
4. The living organism that carries an impure trait is called .....
5. From the peaceful uses of nuclear energy in the agricultural field is .....

B Give reasons for :

1. Mendel chose the pea plant in conducting his experiments. (only two)
2. Ionic compounds are fast in their reactions.
3. The dominance of the wide eyes trait in the human being.

C From the opposite figure :

If the reading of ammeter in the circuit is 10 ampere and the reading of voltmeter is 210 volt.
Calculate the amount of constant electrical resistance, then mention the text of Ohm's law.



Question 2

A Correct the underlined words in the following statements :

1. From **the dominant** traits in the human being is the attached ear lobe.
2. **Oxidizing agent** is a chemical process in which an atom of the element loses an electron or more.
3. The radioactivity phenomenon was discovered by the scientist **Ohm**.
4. From the peaceful uses of nuclear energy in **the medical** field is converting sand to silicon sheets.
5. The scientist Mendel is considered the founder of **physics**.

B What is meant by each of the following .... ?

1. The gene.
2. Chemical activity series.
3. Artificial radioactivity.

C Write the symbolic balanced equations for the following :

1. A reaction of sodium with water.
2. Placing of a piece of magnesium ribbon in a solution of copper sulphate.

Question 3

A Choose the correct answer :

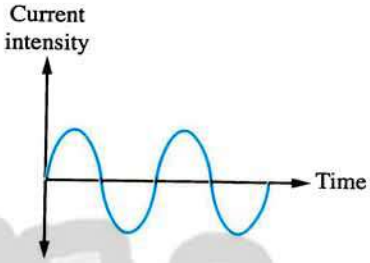
1. A substance which changes the rate of the chemical reaction without being changed is called .....

   a. a catalyst. b. an oxidizing agent. c. a reducing agent.

2. **In the opposite figure :**

   The electric current represents ..... current.

   a. alternating
   b. direct
   c. both of them



3. The chromosome is chemically consisted of a nucleic acid called ..... combined with protein.

   a. RNA b. DNA c. HCl

4. The ..... effect of radiation are results of changing the sex chromosomes.

   a. physical b. cellular c. genetic

5. A reaction of hydrogen gas with hot copper oxide is called ..... reaction.

   a. oxidation and reduction b. double substitution c. simple substitution

B Compare between each of the following :

1. Metal oxide and metal hydroxide. (according to : the decomposition by heat)
2. Hereditary traits and acquired traits. (according to : the concept)

C You have four similar cells, the electromotive force of each is 1.5 volt, explain by using diagrams (by drawing) how you can connect them to obtain an e.m.f. of :

a. 1.5 volt. b. 3 volt. c. 4.5 volt.

Question 4

A Write the scientific term for each of the following :

1. The measuring unit of the absorbed radiation.
2. When two different individuals bearing two pairs or more of alternative (contrasting) traits are crossed, the trait of each pair is inherited independently of the others and appears in the second generation at a ratio of 3 : 1
3. The electric state of a conductor that shows the transference of electricity from or to it.

PART 3

4. It is the substance which takes away oxygen or gives hydrogen during a chemical reaction.
5. The hereditary trait that appears in all individuals of the first generation.

B Explain practical activity illustrating the effect of temperature on the rate (speed) of a chemical reaction.

C Use the following symbols [(R) for the dominant red and (r) for the recessive white] to express the results of mating between pure white flowers pea plant and pure red flowers pea plant. Explain the parents, the gametes and the first filial generation.

Additional questions

Put (✓) or (×) in front of the following statements :

1. The glucagon hormone is secreted by pituitary gland. ( )
2. The iron element shares in composing thyroxin hormone. ( )
3. The decrease in secretion of insulin hormone causes diabetes disease. ( )
4. Sodium carbonate is used in polishing silver. ( )

19 Sohag Governorate

Answer the following questions :

Question 1

A Complete the following statements :

1. The speed of chemical reactions ..... due to the increase of temperature.
2. Oxidation and reduction are two ..... processes.
3. The ..... effects of radiation are results of changing the sex chromosomes of the cells.
4. The ohmmeter is used to measure ..... in the electric circuit.

B Give reasons for :

1. Gold does not react with acids.
2. Mendel chose the pea plant to conduct his experiments.

C 1. Calculate the e.m.f. for a battery consists of 3 cells, the e.m.f. for each cell is 1.5 volt when they are connected :

a. In series. b. In parallel.

2. Use the following symbols to express the results of mating between a short stemmed pea plant (tt) and a long stemmed pea plant (Tt).

Question 2

A Write the scientific term for each of the following statements :

1. A substance that increases the speed of the chemical reaction without interfering in it or being consumed.
2. The quantity of electric charges that flow through a conductor in a time of one second.
3. The traits that are not transmitted from one generation to another.
4. Parts of the DNA that are present on the chromosomes and carry the hereditary traits of the individual.

B Complete the following chemical equations :

1. $NaCl + AgNO_3 \longrightarrow$ ..... + ...
2. $2Na + 2H_2O \longrightarrow$ ..... + ... + heat
3. $CuCO_3 \xrightarrow{\Delta}$ ..... + ...
4. ..... $\xrightarrow{\Delta}$ $2Hg$ + ... ↑

C Calculate the potential difference between the two ends of a vacuum cleaner whose resistance is 22 ohm and the current intensity passing through it is 10 ampere.

Question 3

A Choose the correct answer :

1. Iron filings reacts with diluted hydrochloric acid faster than a piece of iron has the same mass due to the .....
   a. increase in concentration. b. presence of a catalyst.
   c. increase in surface area. d. no correct answer.
2. ..... is a non-radioactive element.
   a. Radium b. Uranium c. Cesium d. Iron
3. The ability to roll the tongue is one of the ..... traits in the human being.
   a. dominant b. recessive c. hybrid d. hermaphrodite
4. Covalent compounds are ..... in their reactions.
   a. fast b. slow c. catalyst d. no correct answer

B Mention one function only for each of the following :

1. Rheostat. 2. Radioactive elements in medicine. 3. Ammeter.

C Write the balanced chemical equations for the following :

1. A metal substitutes the hydrogen of acid (using zinc).
2. A metal substitutes another metal in one of its salt solution (using magnesium).

PART 3

Question 4

A Place the mark (✓) or (×) in front of the following sentences and correct the mistakes :

1. Copper sulphate is decomposed by heat into black copper oxide and sulphur dioxide gas. ( )
2. To generate an alternating electric current, we use the coulomb. ( )
3. The two factors of a hereditary trait are similar in the hybrid individual. ( )
4. In the electric cell, the magnetic energy is converted into electric energy. ( )

B Define each of the following :

1. Ohm's law.
2. Mendel's first law.
3. Neutralization.
4. Rem.

C Calculate the quantity of electricity when an electric current of intensity 18 ampere passes for 7 minutes through a conductor.

Additional questions

A Define the catalytic converter and mention its importance.

B What would happen ..... ?

1. If the pancreas decreases its secretion of the insulin hormone.
2. When the glucose sugar level is increased in blood.
3. When the estrogen hormone doesn't secreted at adulthood stage in a female.

20 Qena Governorate

Answer the following questions :

Question 1

A Complete the following statements :

1. The ..... effects of radiation cause changes in the cells composition.
2. Mendel covered the stigmas of the flowers to prevent the ..... pollination.
3. The ..... apparatus is used to measure the electromotive force.
4. The potential difference between the two terminals of a conductor is ..... proportional to the intensity of the electric current passing through it at a constant temperature.

B Study the following chemical reactions, then answer the following questions :

$\boxed{A} + AgNO_3 \longrightarrow$ Precipitate $+ \boxed{B}$

$2\boxed{B} \xrightarrow{\Delta}$ Salt $+ O_2\uparrow$

1. Write the chemical formula for (A) and (B).
2. Mention the colour of the precipitate and the salt.

C Mention one use (one importance) for each of the following :

1. Sliding rheostat.
2. Genes.

Question 2

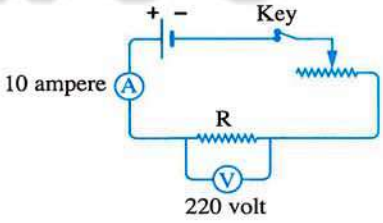
A Choose the correct answer :

1. At the end of the chemical reaction, the concentration of the reactants is ..... %
   a. zero b. 50 c. 75 d. 100
2. The genetic structure of wrinkled yellow coloured seeds of a pea plant is .....
   a. yySS b. YYSS c. yyss d. YYss
3. In the electric cell, ... energy is converted into electric energy.
   a. magnetic b. kinetic c. chemical d. light
4. When passing hydrogen gas on hot black copper oxide, ... process occurs for copper oxide.
   a. oxidation b. reduction
   c. thermal decomposition d. (a) and (b) together
5. Which of the following traits is recessive in the human being ? .....
   a. Wide eyes. b. Black hair.
   c. Presence of dimples. d. Presence of freckles.

B What is meant by .... ?

1. The electric current.
2. Neutralization reaction.
3. The law of independent assortment of hereditary factors.

C In the opposite electric circuit, calculate :



1. The value of the electric resistance.
2. The quantity of electricity passing through the circuit in one minute.

Question 3

A Put (✓) or (×) in front of the following statements :

1. In positive catalytic reactions, catalyst is used to slow down the speed of the chemical reaction. ( )
2. The electromotive force (e.m.f.) of several cells connected in parallel equals the electromotive force (e.m.f.) of one cell. ( )

PART 3

3. The two factors of a hereditary trait are similar in the hybrid individual. ( )
4. The radioactivity phenomenon was discovered by the scientist Badel. ( )
5. Copper sulphate decomposes by heat into copper oxide and sulphur dioxide gas. ( )
6. The acquired traits are not transmitted from one generation to another. ( )

B Compare between :

1. Oxidizing agent and reducing agent (according to : the definition).
2. The direct current and alternating current (according to : the uses).

C What happens in the following cases ..... ?

1. The gene cannot produce its specific enzyme.
2. Putting a small piece of sodium in water.

Question 4

A Write the scientific term for each of the following statements :

1. The change in the concentration of the reactants and the resultants at a unit time.
2. The state of an electric conductor that shows the transfer of the electricity from or to it when it is connected to another conductor.
3. The appearance of a hereditary trait in the individuals of the first generation when two individuals are crossed, one of them carries a pure hereditary trait contrasting the trait carried by the other individual.
4. The measuring unit of the absorbed radiation.
5. The breaking up of bonds between the molecules of the reactants and formation of new bonds between the molecules of the products.

B Give reasons for :

1. The ability of rolling the tongue is dominant trait in the human being.
2. Magnesium substitutes copper in copper sulphate solution.
3. The area chosen for storing radioactive wastes should be steady.

C Using symbols to express the results of mating between white flowers pea plant and pure red flowers pea plant and mention the ratios of resulting offspring in the first generation and second generation.

Additional questions

Mention the role or the function of each of the following :

1. Mammary glands activating hormones.
2. Thyroid gland.
3. Iodine salt.
4. Sodium bicarbonate in the garden.

21 Luxor Governorate

Answer the following questions :

Question 1

A Complete the following statements :

1. Electric cell produces ..... current, while the electric generator (dynamo) produces ..... current.
2. From the factors affecting the speed of the chemical reaction are ..... and .....
3. The chromosome is chemically composed of a nucleic acid called ..... which is combined with .....
4. In the chemical reaction, the concentration of the ..... decreases and the concentration of the ..... increases as the time passes.
5. The blood group is an example of ..... traits, while the learning to walk in children is an example of ..... traits.

B State the contribution (the role) of the following scientists :

1. Badel and Tatum.
2. Henri Becquerel.

C Calculate the quantity of electricity that passes in a conductor of a resistance 1000 ohm for 20 minutes when it is connected with a source of electric potential 220 volt.

Question 2

A Write the scientific term for each of the following statements :

1. It is the science that researches the transmission of the hereditary traits from one generation to another by studying the similarities and differences between the parents and the offspring.
2. It is the current intensity passing through a conductor whose resistance is one ohm and the potential difference across its terminals is one volt.
3. They are chemical substances produced by the body of living organism, act as catalysts that increase the speed of the biological reactions.
4. It is the individual that carries a similar pair of genes either dominant or recessive.
5. They are elements whose atoms nuclei contain a number of neutrons more than the number required for its stability.

B Write the balanced chemical equation for the following reactions :

1. Reaction of water with sodium.
2. Heating of copper hydroxide.
3. Reaction of dilute hydrochloric acid with sodium carbonate.

PART 3

C If crossing takes place between two pea plants, one of them with hybrid red flowers and the other with pure white flowers.

Explain on the genetic principles, the results of such crossing. Mention the characteristics and the ratio of the obtained offspring.

Question 3

A Choose the correct answer :

1. When sodium atom loses an electron from its outermost energy level, it becomes .....
   a. oxidized. b. reducing agent. c. reduced. d. (a) and (b) are correct.
2. The measuring unit of the absorbed radiation is the .....
   a. curie. b. rem. c. ohm. d. ampere.
3. Which of the following traits is dominant in human being ? .....
   a. Smooth hair. b. Absence of dimples.
   c. Wide eyes. d. Presence of freckles.
4. When magnesium replaces copper in its salt solution, a ..... precipitate is formed.
   a. black b. green c. red d. no correct answer.
5. The value of the resistance of an electric conductor in an electric circuit is changed on changing the .....
   a. dimensions of the conductor.
   b. electric current intensity passing through it.
   c. quantity of electricity that passes through it.
   d. potential difference between its terminals.

B Mention one use or function for each of the following :

1. The genes.
2. The nuclear energy in agricultural field.
3. Manganese dioxide.

C Give reason for each of the following :

1. Mendel selected (chose) the pea plant to conduct his experiments.
2. Although aluminium comes before zinc in chemical activity series, but it takes a longer time to react with hydrochloric acid practically.

Question 4

A Put (✓) or (×), then correct what is wrong :

1. Mendel removed the stamens of pea plant flowers before the anther becomes mature during his experiments to prevent cross pollination with other flowers. ( )
2. The oxidizing agent (factor) is the substance which takes oxygen away or gives hydrogen during a chemical reaction. ( )

3. The electric current intensity passing through a conductor is directly proportional to the potential difference across it at a constant temperature. ( )
4. Mendel's second law is called the law of segregation of factors. ( )
5. Most metal sulphates decompose when they are heated to metal oxide and sulphur trioxide gas evolves. ( )

B What happens in the following cases ..... ?

1. Exposing of human body to a large dosage of radiation for a short time.
2. Adding silver nitrate solution to sodium chloride solution.

C You have 4 similar electric cells, the electromotive force of each one is 1.5 volt. Illustrate by drawing how you connect them to get batteries of e.m.f. :

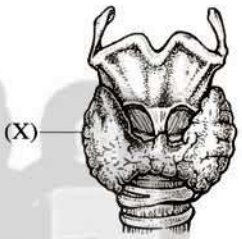
a. 1.5 volt. b. 3 volt c. 6 volt.

Additional questions

A Mention the uses of sodium bicarbonate in the home.

B From the opposite fig., answer the following questions :

1. What is the name of the gland (X) ?
2. Mention the most important secretions of this gland.



22 Aswan Governorate

Answer the following questions :

Question 1

A Complete the following statements :

1. The breaking up of bonds between the reactants molecules and formation of new bonds between the products molecules is called .....
2. The chromosome is chemically composed of a nucleic acid called ..... which is combined with protein.
3. The ..... apparatus is used for measuring the current intensity, and the ..... apparatus is used to measure the resistance in the electric circuit.

B Use the following symbols to express the results of mating between a pure short stem pea plant (tt) and a pure tall stem pea plant (TT).

C Mention the uses of each of the following :

1. The alternating electric current.
2. The nuclear energy in the drilling field.

PART 3

Question 2

A Choose the correct answer :

1. At the beginning of the chemical reaction, the ratio of the reactants concentration equals .....

   a. 100% b. 50% c. 20% d. zero%

2. In dynamo, the ..... energy is converted into the electric energy.

   a. magnetic b. kinetic c. chemical d. light

3. The measuring unit of the absorbed radiation is .....

   a. curie. b. ampere. c. roentgen. d. rem.

4. The two factors of a hereditary trait are similar in the ..... individual.

   a. pure b. hybrid c. recessive d. (a) and (c) together

B Give reasons for :

1. The rate of the reaction of hydrochloric acid with iron filings is faster than a piece of iron has the same mass.
2. Uranium is considered from radioactive elements.

C If an electric current of 0.2 ampere passes through an electric heater and the potential difference between its two ends is 220 volt. Calculate the heater's resistance.

Question 3

A Write the scientific term for each of the following statements :

1. They are parts of DNA present on the chromosomes and control the hereditary traits of the individual.
2. Reaction between an acid and an alkali to form salt and water.
3. The radiation or nuclear energy emitted during nuclear reactions that can be controlled and carried out by nuclear reactors.
4. The state of a conductor that shows the transference of electricity from or to it, if it is connected to another conductor.

B Compare between heating of metal oxide and metal hydroxide.

C Chemical reactions are classified into different types.

Write the type of each reaction of the following :

1. $H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$
2. $Zn + 2HCl \xrightarrow{dil.} ZnCl_2 + H_2\uparrow$

Question 4

A Correct the underlined words in the following statements :

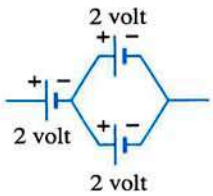
1. The **acquired** traits are transmitted from one generation to another.
2. The rate (speed) of chemical reaction is increased by **decreasing** the temperature.
3. The reactions of ionic compounds are **slower** than that of the covalent compounds.
4. The **attached** ear lobe is a dominant trait in human being.

B Define each of the following :

1. Chemical activity series.
2. Coulomb.

C By using the opposite figure :

Calculate the total electromotive force.



Additional questions

What is meant by ..... ?

1. Hormone disorder.
2. Simple goiter.
3. Gigantism.
4. Diabetes.

23 New Valley Governorate

Answer the following questions :

Question 1

A Choose the correct answer :

1. The apparatus used to control the value of electric resistance in the electric circuit is the .....
   a. ohmmeter. b. rheostat. c. voltmeter.
2. The substance that changes the rate of the reaction without itself being changed is known as the .....
   a. oxidizing agent. b. reducing agent. c. catalyst.
3. ..... is chemically composed of the nucleic acid DNA combined with protein.
   a. Cytoplasm b. Chromosome c. Gene
4. The measuring unit of the absorbed radiation is .....
   a. rem. b. roentgen. c. ampere.

PART 3

B Write the balanced chemical equations for the following reactions :

1. The reaction of hydrochloric acid with sodium hydroxide.
2. The decomposition of sodium nitrate by heat.
3. Reduction of hot copper oxide by hydrogen.

C What happens when ... ?

1. The atom nucleus of an element contains a number of neutrons more than the number required for its stability.
2. You keep food outside the refrigerator for a long time.
3. Two charged conductors touch and the electric potential of one conductor is 10 volt but the electric potential of the other conductor is 30 volt.

Question 2

A Complete the following sentences :

1. Dry cells produce ..... current, while electric generators produce ..... current.
2. Learning swimming is one of the ..... traits, but the blood group is one of the ..... traits.
3. A chemical reaction is the ..... in the molecules of the reactants and formation of ..... in the molecules of the resultants from the reaction.
4. One of the cellular effects of radiation is that a change happens in the ..... like the change of chemical composition of .....

B Give reasons for :

1. On adding silver nitrate solution to sodium chloride solution, a white precipitate is formed.
2. The ability of bending the tongue is a dominant trait in human being.
3. The rate of the reaction in ionic compounds is more than the rate of the reaction in covalent compounds.

C Calculate the quantity of electricity that passes in a conductor which has a resistance 2200 ohm for two minutes if the potential difference between its two terminals is 220 volt.

Question 3

A Write the scientific term for each of the following statements :

1. A substance which loses one electron or more during a chemical reaction.
2. The spontaneous conversion of the nuclei of the atoms of some radioactive elements that are present in nature to achieve a more stable composition.
3. The amount of electric charges that flow through a conductor in one second.
4. An enzyme in sweet potato which helps to break up hydrogen peroxide.

B Write the physical quantity which is measured by each of the following units :

1. Joule/coulomb.
2. Coulomb/second.

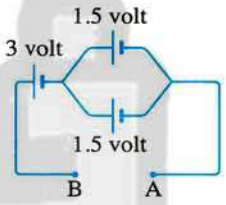
C Using the symbols to represent the results of copulation between pea plant with white flowers and another pea plant with red flowers.

Question 4

A Rewrite the following statements after correcting the underlined words :

1. Mendel's second law is known as the law of **segregation of factors**.
2. In the chemical activity series, the arrangement of the metals is in a descending order according to **their atomic weights** .
3. The **digestive system** is the first to be affected by the nuclear radiation.
4. The electric current intensity passing through a conductor is **inversely** proportional to the potential difference between its two ends when the temperature is constant.

B In the opposite figure, calculate the electromotive force (e.m.f.) between the two terminals (A) & (B).



C Scientists were interested in finding safe uses of the nuclear energy. Name the most important of these uses in the agriculture field, medicine field and drilling field.

Additional questions

Choose the correct answer :

1. The ceramic cells in the catalytic converter leads to .....
   a. increasing the surface area exposed to the reaction.
   b. increasing the concentration of the reactants.
   c. increasing the temperature.
   d. no correct answer.
2. Sodium bicarbonate is used in polishing silver by using a piece of ..... during washing.
   a. copper foil b. zinc foil c. aluminium foil d. chrome foil
3. ..... element shares in composing thyroxin hormone.
   a. Iodine b. Iron c. Sodium c. No correct answer

24 South Sinai Governorate

Answer the following questions :

Question 1

A Complete the following statements :

1. The alternating electric current has variable intensity and .....
2. Mendel removed the stamens from the flowers of the plants to prevent ..... pollination, while he covered the stigmas of the flowers to prevent ..... pollination.
3. The ohmmeter instrument is used to measure ..... in electric circuit.
4. $2Al + 6HCl \longrightarrow$ ..... $+ 3H_2\uparrow$

B Mention the importance of each of the following :

1. The nuclear energy in the medical field.
2. The catalyst in chemical reactions.

C Calculate the quantity of electricity due to the flow of electric current has 18 ampere for 5 minutes.

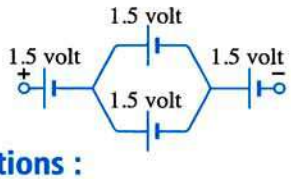
Question 2

A Write the scientific term for each of the following statements :

1. The chemical reaction in which the compound decomposes by heat into simpler components.
2. The flow of electric negative charges in a conducting substance (as a metal wire).
3. The change in the concentration of the reactants and products at a unit time.
4. They are parts of DNA present on the chromosomes and control the hereditary traits of the individual.

B From the opposite figure :

Calculate the electromotive force (e.m.f.) of the battery.



C Show by symbolic balanced chemical equations the following reactions :

1. The effect of heat on sodium nitrate.
2. The reaction of water with sodium.

Question 3

A Choose the correct answer :

1. If an electric current has 0.2 ampere passes through an electric heater and the potential difference between its terminals equals 220 volt, so the heater resistance equals ..... ohm.
   a. 20 b. 1000 c. 1100 d. 2200
2. The reaction between silver nitrate and sodium chloride is from ..... reactions.
   a. fast b. intermediate c. slow d. very slow
3. From the dominant traits in the human being is ..... trait.
   a. straight hair b. attached ear lobe c. narrow eyes d. absence of freckles
4. From non-radioactive elements is .....
   a. radium. b. uranium. c. cesium. d. iron.

B In the following reaction losing and gaining electrons take place, determine the oxidizing agent and reducing agent and mention the reason.

$$2Na + Cl_2 \longrightarrow 2NaCl$$

[Knowing that the atomic number of sodium (Na) equals 11 and chlorine (Cl) equals 17].

C The radiation has genetic effects. Explain this statement practically.

Question 4

A Correct the underlined words for the following :

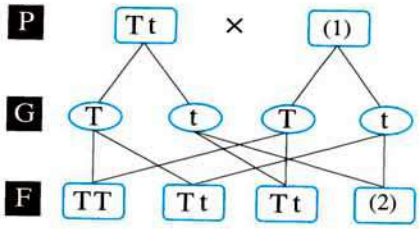
1. Most metal carbonates decompose by heat into **metal** and carbon dioxide.
2. The measuring unit of electromotive force is **coulomb**.
3. Mendel's second law is known as the law of **segregation of factors**.
4. The dynamo (electric generator) converts the **light** energy into electric energy.

B Give reasons for the following :

1. The rate of the reaction of hydrochloric acid with iron filings is faster than a piece of iron has the same mass.
2. The sliding rheostat is used in some electric circuits.

C In the opposite figure, a self pollination takes place in hybrid pea plant with tall stem :

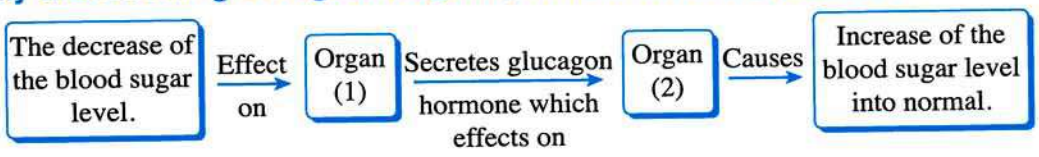
Replace the numbers (1 & 2) with suitable symbols.



PART 3

Additional questions

A Study the following biological diagram, then answer the questions :



a. What is the name of organ (1) ?

b. What is the name of organ (2) ?

B What is the importance of air bags ?

25 Red Sea Governorate

Answer the following questions :

Question 1

A Complete the following statements :

1. On connecting two charged conductors, the electric current passes from the conductor with ..... potential to the conductor which has ..... potential.
2. During Mendel's experiments, he removed the stamens from the flowers to prevent ..... pollination, and he covered the stigmas of flowers to prevent ..... pollination.
3. $2HgO \xrightarrow{\Delta}$ ..... + ...
4. When sodium atom ($_{11}Na$) combines with chlorine atom ($_{17}Cl$), ... is considered as an oxidizing agent, while ..... is considered as a reducing agent.
5. The electric current intensity passing through a conductor is ..... proportional to the resistance of a conductor and ..... proportional to the potential difference between the two terminals of a conductor.

B What happens when ..... ?

1. Putting two effervescent tablets in two beakers, one of them contains cold water and the other contains hot water.
2. Exposing a man for a large dosage of atomic radiation for a short period of time.
3. Heating the solution resulting from the reaction between hydrochloric acid and sodium hydroxide.

C Mention one use or function for each of the following :

1. Ohmmeter.
2. Nuclear energy in agricultural field.

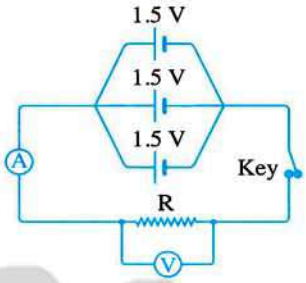
Question 2

A Give reasons for :

1. The speed of chemical reaction increases when the concentration of the reactants increases.
2. The ability of rolling the tongue is dominant trait in the human.
3. Some electric cells are connected in the electric circuit in series.
4. A red precipitate is formed when magnesium is added to copper sulphate solution. (write the balanced chemical equation).

B From the opposite electric circuit :

If a quantity of electricity which passes through the electric circuit in a time 40 second is 20 coulomb.



Find : 1. The ammeter reading.

2. The voltmeter reading.

3. The value of the resistance (R).

C Using the symbols (T , t) to express the results of mating between two pea plants, both of them have hybrid tall stem. Showing :

(parents – gametes – ratio of the offspring)

Question 3

A Write the scientific term for each of the following :

1. The enzyme which is found in sweet potato and accelerates the decomposition rate of hydrogen peroxide.
2. The process of spontaneous decaying of atoms of some elements present in nature to reach a more stable composition.
3. Parts of DNA that are present on the chromosomes and control the hereditary traits of the individual.
4. A chemical process which causes the increase in the oxygen percentage or the decrease in the hydrogen percentage.

B Correct the underlined words for the following :

1. The reactions of ionic compounds are **slower** than that of covalent compounds.
2. Most metal sulphates decompose by heating into metal oxide and **nitrogen** gas.
3. The atom's **proton** is considered as the energy store.
4. Mendel's second law is called the law of **segregation of factors**.

PART 3

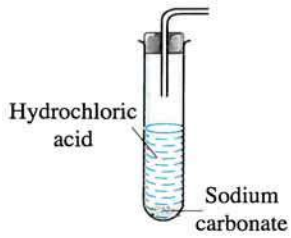
C Compare between :

The direct electric current and the alternating electric current according to :

(Source – Graphical representation)

Question 4

A From the opposite figure :



1. a. What is the name of the evolved gas from the reaction ?
   b. How do you discover it ?
2. a. Write the balanced chemical equation for the reaction.
   b. What is the type of the reaction ?

B Choose the correct answer :

1. The measuring unit of the absorbed radiation is the .....
   a. joule. b. rem. c. ohm. d. volt.
2. The physical quantity which its measuring unit equivalent (joule/volt. second) is .....
   a. current intensity. b. potential difference.
   c. work done. d. quantity of electricity.
3. On adding silver nitrate solution to sodium chloride solution, a ..... precipitate is formed.
   a. red b. black c. blue d. white
4. The two scientists ..... discovered how do the genes perform their functions.
   a. Watson and Crick b. Badel and Crick
   c. Badel and Tatum d. Watson and Becquerel
5. All of the following metals replace hydrogen of an acid except .....
   a. Sn b. Au c. Zn d. Al

C What is meant by ..... ?

1. Acquired traits.
2. The potential difference across two terminals of a conductor is 5 volt.

Additional questions

Mention the disease or the disorder results due to :

1. The decrease in the growth hormone secretion at childhood stage.
2. The increase in the growth hormone secretion at childhood stage.
3. The insulin hormone deficiency.

26 Matrouh Governorate

Answer the following questions :

Question 1

A Complete the following statements :

1. Sodium reacts with water giving ..... and ..... gas evolves.
2. The catalyst changes the speed of the reaction but don't affect either its ..... or .....
3. Volt = $\frac{\text{Joule}}{\ldots\ldots \times \ldots\ldots}$
4. Nuclear energy can be used in agricultural field to ..... and to improve .....
5. Every gene gives a special ..... which is responsible for occurrence of a chemical reaction resulting in ..... showing a specific hereditary trait.

B In a pea plant, what are the results of self-pollination of hybrid tall plant by using the symbols (T , t) showing (parents, gametes, offspring). Mention the ratio of the resulted generation.

C Show by balanced chemical equations each of the following :

1. Heating of copper sulphate.
2. Adding hydrochloric acid to sodium carbonate.

Question 2

A Choose the correct answer :

1. If an electric current whose intensity is one ampere passes through a resistance of 20 ohm, then the intensity of the electric current increases to 2 ampere in the same resistance, so the value of the resistance .....
   a. increases to double. b. decreases to half.
   c. decreases to quarter. d. does not change.
2. The reaction between silver nitrate solution and sodium chloride solution is ..... reaction.
   a. fast b. slow c. very slow d. average
3. When a short stemmed, white flowered pea plant is cross pollinated with a long stemmed, red flowered pea plant so, plants of 1st generation are .....
   a. long stemmed & white flowered. b. long stemmed & red flowered.
   c. short stemmed & white flowered. d. short stemmed & red flowered.
4. Sodium metal can replace all of the following metals from their salt solutions except .....
   a. copper. b. potassium. c. magnesium. d. zinc.

PART 3

5. In dynamo, ... energy is converted into electric energy.

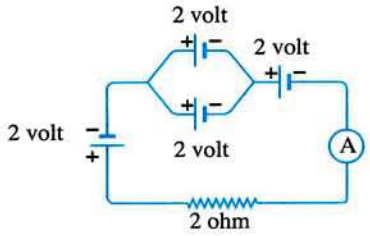
a. magnetic b. kinetic c. chemical d. light

B What happens when ...?

1. A human body is exposed to a large dosage of radiation for a short time.
2. Two conductors having the same electric potential are connected together by a wire.

C In the opposite electric circuit :

Calculate the reading of the ammeter.



Question 3

A Give reasons for :

1. The nuclei of radioactive elements are unstable.
2. Burning of the steel scourers used for cleaning aluminium in a jar full of oxygen is faster than its burning in atmospheric air.
3. Mendel removed the stamens from the flowers of the plants before the anther becomes mature.
4. The voltmeter is connected between the two poles of battery.

B Put (✓) or (×), then correct what is wrong :

1. Genes are parts of DNA found in the cytoplasm of the cell. ( )
2. Ohmmeter is used to control the electric resistance in the electric circuit. ( )
3. Aluminium reacts with diluted hydrochloric acid faster than the reaction of zinc with the same acid. ( )
4. In the reaction : $H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$ Hydrogen is an oxidizing agent. ( )

C Mention one of the most important efforts of the following scientists :

1. Watson and Crick.
2. Henri Becquerel.

Question 4

A Write the scientific term for each of the following statements :

1. The change in the concentration of the reactants and resultants in a unit time.
2. The ratio between the potential difference across the two ends of a conductor and the electric current intensity passing through it.
3. They are changes that appear on a living organism as a result of exposure to radiation.
4. They are the traits that are transmitted from one generation to another.
5. A chemical process where the atom loses an electron or more.

B Draw and write down labels to represent each of the following :

1. The electric circuit that is used to verify Ohm's law.
2. Graphic representation of the alternating current.

C What is meant by ..... ?

1. Potential difference.
2. The direct electric current.
3. Chemical reaction.

Additional questions

A What would happen when man takes a little amount of iodine in his food ?

B Mention the role or function of pancreas gland.

C Write a short note about the uses of sodium bicarbonate in the garden.

Final Examinations 2017

1 Cairo Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. The ..... is used to measure the electromotive force of the battery in measuring unit called .....
2. When magnesium replaces copper in its salt solution, a precipitate its colour is ..... is formed.
3. When glucose level is increased in blood, the pancreas secretes ..... hormone.

B Define each of the following :

1. The alternating electric current. (mention its uses)
2. The law of independent assortment of hereditary factors.
3. The speed of chemical reaction.

C Calculate the quantity of electricity that passes through a conductor of a resistance 2200 ohm for 30 minutes if the potential difference between its terminals is 220 volt.

Question 2

A Choose the correct answer :

1. The ..... hormone liberates the energy necessary for the body from food.
   a. growth b. estrogen c. thyroxin d. glucagon
2. Active metals substitute hydrogen of water and produce metal hydroxide and ..... gas evolves.
   a. N_2 b. O_2 c. H_2 d. CO_2
3. The two factors of a hereditary trait are similar in the ..... individual.
   a. pure b. hybrid c. recessive d. (a) and (c)
4. The most active metal in the chemical activity series is .....
   a. copper. b. sodium. c. hydrogen. d. aluminium.
5. The ..... is used to control the resistance in the electric circuit.
   a. rheostat b. ammeter c. voltmeter d. ohmmeter

B From the opposite reaction : $2Na + Cl_2 \longrightarrow 2NaCl$

Explain oxidation and reduction processes.

[If you know that the atomic number of Na is (11) and Cl is (17)]

C **Explain on genetic bases the properties of the generation produced from self-pollination in a pea plant that has a hybrid yellow seeds. [knowing that the dominant gene is symbolized by (Y) and the recessive one is symbolized by (y)]. Mention the ratio of the produced individual.**

Question 3

A **Write the scientific term :**

1. The opposition that the electric current faces during its passage through a conductor.
2. Organs secrete hormones directly in the blood stream.
3. The charge transferred by a constant current of intensity one ampere in one second.
4. It is a chemical reaction where the double substitution occurs between the ions of two compounds to form two new compounds.

B **Compare between :**

The two testes and the two ovaries (according to : function).

C **Give reasons for :**

1. Uranium is considered from radioactive elements.
2. The combustion of steel scourers used for cleaning aluminium in a jar contains oxygen is faster than its combustion in the air.
3. The ability to roll the tongue is one of the dominant traits in the human being.

Question 4

A **Re-write the following statements after correcting the underlined words :**

1. The reactions of covalent compounds are **faster** than that of ionic compounds.
2. The **glucagon** hormone controls the calcium level in the blood.
3. The nucleus of each cell carry a complete group of **hormones** which are responsible for the appearance of the hereditary traits in living organisms.
4. A person becomes giant on increasing the secretion of **testosterone** hormone at the childhood stage.

B **What would happen when ... ?**

1. Heating of red mercuric oxide (Illustrate by balanced symbolic equation).
2. Touching two charged conductors by a conducting bar, the first conductor has an electric potential is equal to the electric potential of the second one.

C **You have four similar cells, the e.m.f. for each cell is 1.2 volt. Explain by using diagrams how you can connect them to obtain a battery of e.m.f. 2.4 volt with two different ways.**

PART 3

2 Giza Governorate

Answer the following questions :

Question 1

A Complete the following sentences :

1. $NaOH + \cdots\cdots \longrightarrow NaCl + H_2O$
2. The radioactivity phenomenon was discovered by ..... scientist.
3. When the amount of glucose decreases in the blood, pancreas secretes ..... hormone.
4. In the electric cell, ... energy is converted into electric energy.

B Compare between :

The direct current and the alternating current (in view of definition).

C Using symbols to express the results of mating between white flower pea plant and the other red flower plant. Mention the ratio of the produced individuals.

Question 2

A Choose the correct answer :

1. To control the value of the electric resistance in the electric circuit, we use ..... instrument.
   a. ohmmeter b. rheostat c. voltmeter
2. The ..... is chemically composed of the nucleic acid DNA combined with protein.
   a. cytoplasm b. gene c. chromosome
3. The hormone whose deficiency causes the enlargement of the thyroid gland is .....
   a. estrogen. b. thyroxin. c. insulin.

B Mention one importance for : Adrenalin hormone.

C Calculate the potential difference between the two ends of a conductor, whose resistance is 22 ohm and the current intensity is 10 ampere.

Question 3

A Write the scientific term :

1. The flow of electric negative charges through a conducting material.
2. The trait that appears in all individuals of the first generation in Mendel's experiments.
3. Organs secrete hormones directly into blood stream.
4. A substance which changes the rate of chemical reaction without being changed.

B What happens if ... ?

1. The stigma of the flower of pea plant uncovered during the study of the inherited traits.
2. Heating blue copper hydroxide.

C You have three similar cells, the electromotive force of each is 1.5 volt. Explain by drawing how can you get :

1. A battery of e.m.f. (1.5 volt).
2. A battery of e.m.f. (4.5 volt).

Question 4

A Correct the underlined words :

1. Rate (speed) of chemical reaction is increased by **decreasing** the temperature.
2. **Attached** ear lobe is one of the dominant trait in human being.
3. The hormone which regulates the level of calcium in the blood is the **insulin** hormone.

B Give reasons for :

1. The rate of chemical reaction is increased by increasing the reactants concentration.
2. The areas chosen for storing radioactive wastes should be steady.

C In the following reaction, determine the oxidizing agent and the reducing agent.

$$H_2 + CuO \xrightarrow{\Delta} Cu + H_2O$$

3 Alexandria Governorate

Answer the following questions :

Question 1

A Write the scientific term for the following :

1. The quantity of electricity in coulomb that flows through a cross-section of a conductor in one second.
2. The hormone that controls the speed rate of muscles and bones growth.
3. The substance which loses one electron or more during a chemical reaction.

B Write the symbolic balanced equations for the following :

1. The reaction of sodium with water.
2. Breaking down of nitrogen pentoxide gas.

C Illustrate briefly how the gene does its function.

Question 2

A Correct the underlined parts in the following :

1. The ionic compounds are fast in their reactions, because they decompose into **molecules** that easy share in the reaction.
2. Mendel removed the **petals** from the flowers of pea plant to prevent the self-pollination.
3. On decreasing of sugar level in the blood, the **liver** responds by secreting glucagon hormone.

PART 3

B Compare between the exophthalmic goiter and diabetes concerning the reason and the symptoms.

C Mention one use or function for each of the following :

1. The nuclear energy in medicine.
2. Testosterone hormone.

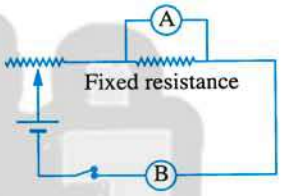
Question 3

A Complete the following :

1. Transmission of electric charges depends on the ..... between two conductors.
2. Breaking down the bonds between the molecules of the reactants and formation of new bonds between the molecules of products is called .....
3. The thyroid gland secretes ..... hormone that regulates the calcium level in the blood.
4. Henri Becquerel discovered the emission of an unseen rays from ..... element.

B What is meant by the hormone ?

C From the opposite electric circuit,complete :



1. The instrument Ⓐ represents ..... that measures .....
2. The instrument Ⓑ represents ..... that is connected in the circuit in .....

Question 4

A Choose the right answer :

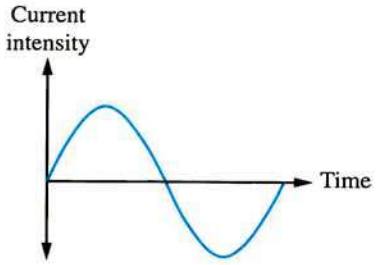
1. Thermal decomposition of copper carbonate gives .....
   a. copper + water.
   b. copper + carbon dioxide.
   c. copper oxide + carbon dioxide.
   d. copper oxide + water vapour.
2. The recessive trait appears on one of the sons if he inherited ..... from the parents.
   a. two dominant genes
   b. only one dominant gene
   c. two recessive genes
   d. a recessive gene and a dominant gene
3. From the examples of electrochemical cells is the .....
   a. dry cell.
   b. dynamo.
   c. rheostat.
   d. ohmmeter.

B The pea plant that has tall or short stems also it has red or white flowers. If (T) represents the tallness of stem and (R) represents the red colour of flowers, so what is the genetic structure of the following :

1. Hybrid tall stemmed and red flowered plant.
2. Short stemmed and white flowered plant.

C Give reasons for :

1. The opposite graph represents the alternating current.



2. On adding hydrochloric acid to aluminium, the reaction happens after a short time.

4 El-Kalyoubia Governorate

Answer the following questions :

Question 1

A Write the scientific term :

1. A chemical substance that controls and organizes most of the vital activities and functions.
2. A type of the chemical reaction which involves the breaking up of the compound into simple elements by the effect of heat.
3. The process of spontaneous decaying of atoms nuclei of some radioactive elements that are present in nature.
4. The electric current that is produced from converting the mechanical energy into electric energy by means of the dynamo.

B Give reasons for :

1. If the electric current intensity passing through a conductor increases, then the potential difference across its terminal increases.
2. The rate (speed) of chemical reaction increases by increasing temperature.

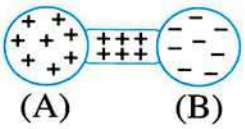
C Illustrate by balanced chemical equations the following reactions :

1. The reaction of sodium hydroxide with hydrochloric acid.
2. The effect of heat on copper sulphate.

Question 2

A What happens when ... ?

1. In the opposite figure, the electric potential at point (A) is equal to the electric potential at point (B) [according to the flow of the electric current through the conductor (A B)].



2. Lack of iodine from food.
3. A substance gains an electron or more during a chemical reaction.

PART 3

B **If crossing takes place between two pea plants, one of them with yellow seeds and the other with green seeds, this crossing produced 50% yellow seeds and 50% green seeds. Explain on genetic principles :**

– The genetic structure of parents.

– The gametes forming the first generation.

– The genetic structure of the produced generation.

Question 3

A **Choose the correct answer :**

1. From the dominant traits in the human being is .....

a. smooth hair. b. wide eyes. c. absence of dimples. d. presence of freckles.

2. The active metals can replace the hydrogen of water which evolves and produce .....

a. metal hydroxide. b. metal oxide. c. metal carbonate. d. metal sulphate.

3. During the reaction between hydrogen and black copper oxide, ... process occurs for copper oxide.

a. oxidation b. reduction

c. oxidation and reduction d. no correct answer

4. The amount of electricity is measured by .....

a. volt. b. ampere. c. volt/ampere. d. ampere × second.

B **Mention three ways of protection from radiation pollution.**

C **You have four similar electric cells and the electromotive force of each one is 1.2 volt illustrate by drawing only how you connect them to get batteries of electromotive force of :**

1. 1.2 volt. 2. 2.4 volt.

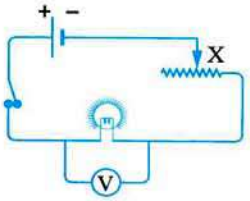
Question 4

A **Compare between each of the following :**

1. Estrogen hormone and testosterone hormone (according to : the function of each one).
2. Direct current and alternating current (according to : the uses of each one).
3. Oxidation and reduction (according to : the definition of each one).
4. Dwarfism and gigantism (according to : the reason of occurrence of each one).

B **Mention without explanation three factors affecting the speed of a chemical reaction.**

C **The opposite figure represents an electric circuit which contains a lamp, the resistance of its filament is (10) ohm. If the electric current intensity passes through the lamp increases more than (0.1) ampere, its filament melts, answer the following questions :**



1. Does the filament melt or not when passing an electric current in the circuit ? Why ? if you know that the reading of the voltmeter which is connected to it on parallel is (5) volt.
2. What is the name of the part (X) ? And what is its function ?

5 El-Sharkia Governorate

Answer the following questions :

Question 1

A **Complete the following statements with suitable words :**

1. ..... hormone is responsible for female secondary sex characters.
2. $Na_2CO_3 + 2HCl \longrightarrow$ ..... $+ H_2O +$ .....
3. The ..... is used to measure the electric resistance in units known as .....
4. Electrochemical cells convert ..... energy into ..... energy.

B **What would happen ... ?**

1. When pancreas does not secrete glucagon hormone.
2. If the length of the rheostat wire increases (Related to the electric current intensity).
3. When adding a negative catalyst to a rapid reaction.

C **Use the following symbols to express the results of mating between two pea plants both of them are yellow hybrid seeds (Yy).**

Question 2

A **Write the scientific term for each of the following statements :**

1. They are parts of DNA present on the chromosomes and control the hereditary traits of the individual.
2. The measuring unit of the absorbed radiation.
3. The result when one of the endocrine glands does not work properly.
4. A chemical compound which is resulted from the reaction of acid with alkali.
5. The breaking up of bonds in molecules of the reactants and formation of new bonds in the molecules of resultants (products).

B **Give a reason for :**

Gold does not react with diluted acids.

PART 3

C Compare between :

1. Calcitonin hormone and progesterone hormone (according to : function only).
2. Covalent compounds and ionic compounds.

Question 3

A Correct the underlined words :

1. When we add silver nitrate solution to sodium chloride solution, a white precipitate of **sodium nitrate** is formed.
2. **Mendeleev** is considered as the founder of heredity.
3. The **iron element** shares in composing thyroxin hormone.
4. The radioactivity phenomenon was discovered by the scientist **Ohm**.
5. $Fe + 2HCl \xrightarrow{dil.} \mathbf{Fe_2Cl_3} + H_2 \uparrow$

B What is meant by each of the following ... ?

1. Pure individual.
2. Rem.

Question 4

A Choose the correct answer :

1. At the beginning of the reaction, the ratio of the reactants concentration equals .....
   a. 100% b. 0% c. 50% d. no correct answer.
2. ..... is chemically composed of the nucleic acid DNA combined with protein.
   a. Cytoplasm b. Chromosome c. Gene d. Nucleus
3. The two factors of a hereditary trait are different in the ..... individual.
   a. dominant pure b. recessive
   c. hybrid d. dominant pure and recessive
4. ..... is a non-radioactive element.
   a. Radium b. Uranium c. Zerconium d. Iron

B If the potential difference between two ends of a conductor is 6 volt and the electric current intensity passing in the conductor is 0.5 ampere.

What is the electric current intensity passing in this conductor if it is connected by an electric source, its electric potential is 12 volt ?

C What is the importance of ... ?

1. Human genome project.
2. Pituitary gland.

1 Cairo Governorate

1

(A) 1. voltmeter. 2. protein.
3. hydrogen
4. dominant – recessive

(B) 1. It is the arrangement of metals in a descending order according to the degree of their chemical activity.
2. It is the spontaneous decay of the atoms' nuclei of radioactive elements that are present in nature in an attempt to achieve a more stable composition.
3. It is the flow of electric negative charges (electrons) through a conductor.

(C) $I = \frac{q}{t} = \frac{6000}{5 \times 60} = 20$ ampere

2

(A) 1. b 2. c 3. d 4. c 5. d

(B) 1. $E_{(battery)} = n \times E_1$

e.m.f. $= 3 \times 3 = 9$ volt

2. $E_{(battery)} = E_1$

e.m.f. $= 3$ volt

(C) 1. This may lead to the damage of :
- Bone marrow. • Spleen.
- Digestive system.
- Central nervous system.

2. A yellowish white substance of sodium nitrite is formed and oxygen gas evolves.

$2NaNO_3 \xrightarrow{\Delta} 2NaNO_2 + O_2\uparrow$

3. A white ppt. of silver chloride is formed.

$NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$

3

(A) 1. Speed of chemical reaction.
2. Neutralization reaction.
3. Oxidizing agent. 4. Chemical reaction.
5. Double substitution reactions.
6. The coulomb.

(B) 1. ***Look at the main book on page*** **(131).**
2. ***Look at the main book on page*** **(23).**

4

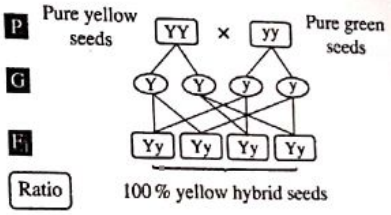
(A) 1. segregation of factors. 2. oxygen
3. faster 4. genes.
5. kinetic

(B) 1. Because magnesium comes before copper in C.A.S., so it replaces copper in copper sulphate solution.

$Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$

2. Due to :
- It is easy to be planted and it grows fast.
- Its life cycle is short.
- Its flowers are hermaphrodite, so it can be self-pollinated.
- It can easily be artificially pollinated (human intervention).
- It produces large numbers of plants in a generation.
- It has several pairs of easily recognized contrasting traits.

(C)



Additional questions

(A) 1. a 2. d

(B) Because they secrete their hormones directly in blood without passing through ducts.

2 Giza Governorate

1

(A) 1. 2HCl
2. it has constant intensity and direction.
3. gametes. 4. specific enzyme

(B) 1. ***Look at the main book on page*** **(23).**
2. ***Look at the main book on page*** **(168).**

(C) This means that the ratio between the potential difference across the two ends of the conductor and the current intensity passing through it is 25 ohm.

2

(A) 1. b 2. b 3. d 4. a

(B) 1. Due to :
- It is easy to be planted and it grows fast.
- Its life cycle is short.
- Its flowers are hermaphrodite, so it can be self-pollinated.
- It can easily be artificially pollinated (human intervention).
- It produces large numbers of plants in a generation.
- It has several pairs of easily recognized contrasting traits.

2. To control the electric current intensity passing through the circuit and the potential difference in the different parts of the circuit.

(C) Work (W) = Potential difference (V) × quantity of electricity (q) = 50 × 20 = 1000 joule.

3

(A) 1. Negative catalyst.
2. Electric current intensity.
3. Pure individual.
4. Chemical activity series.

(B) 1. The speed of chemical reaction increases.
2. The trait of each pair is inherited independently and all individuals of the first generation appear carrying the dominant traits only, and in the second generation, the dominant trait and the recessive trait appear at a ratio of 3 : 1

(C) Figure (c).

4

(A) 1. seven 2. red
3. equal to 4. H_2

(B) 1. They are the traits that are transmitted from one generation to another.
2. They are chemical reactions which involve the breaking up of the compounds by the effect of heat into its primary elements or simpler compounds than the original ones.

(C) By disappearance rate of the blue colour of copper sulphate solution or the appearance rate of the blue colour of copper hydroxide ppt.

Additional questions

1. d 2. d 3. a

3 Alexandria Governorate

1

(A) 1. The Sievert. 2. dominant
3. manganese dioxide – sweet potato.

(B) 1. $Mg + CuSO_4 \longrightarrow MgSO_4 + Cu\downarrow$

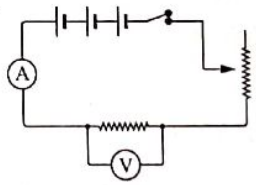
2. $2NaNO_3 \xrightarrow{\Delta} 2NaNO_2 + O_2\uparrow$

(C) – They decrease the energy needed for the reaction.
– They change the speed of reaction but don't affect either its beginning or stopping.

2

(A) 1. Speed of chemical reaction.
2. Electric potential of a conductor.
3. Hereditary (genetic) traits.

(B) 1.



2. e. m. f. = 2 × 3 = 6 volt.

$R = \frac{V}{I} = \frac{6}{6} = 1$ ohm.

(C) It is used to diagnose and treat diseases like cancer.

3

(A) 1. Hydrogen (H_2), because it takes oxygen from copper oxide.
2. Sodium (Na), because it loses one electron.

(B) 1. nucleus 2. electrons

(C) When two pure individuals of any one pair of hereditary traits are different from each other, only the dominant trait appears in the first generation, while the two traits appear in the second generation at a ratio of 3 (dominant trait) : 1 (recessive trait).

1

(A) 1. c 2. b 3. b 4. a

(B) 1. Because the surface area in case of iron filings is larger than that in case of iron piece and the speed of chemical reactions increases by increasing the surface area.

2. Due to :
- It is easy to be planted and it grows fast.
- Its life cycle is short.
- Its flowers are hermaphrodite, so it can be self-pollinated.
- It can easily by artificially pollinated (human intervention).
- It produces large numbers of plants in a generation.
- It has several pairs of easily recognized contrasting traits.

(C) Because the plant of yellow seeds is carrying a hybrid dominant trait.

Additional questions

(A) 1. catalytic converter

2. pituitary gland – master gland – main gland.

(B) 1. (✗) 2. (✓)

4 El-Kalyoubia Governorate

1

(A) 1. The chromosome.

2. The electromotive force.

3. The catalyst. 4. The coulomb.

5. Human genome.

(B) 1. Figure (2).

2. Alternating current – It is produced from dynamo.

(C) 1. Because the gene of the ability to roll the tongue dominates over the gene of the non-ability to roll the tongue if they are both present together in an individual.

2. To control the electric current intensity in the electric circuit and consequently the electric potential difference between its ends.

3. Because copper comes after hydrogen in C. A. S , so it can't replace hydrogen in acids, while zinc comes before hydrogen in C. A. S. so it replaces hydrogen in acids.

$Zn + 2HCl \xrightarrow{dil.} ZnCl_2 + H_2\uparrow$

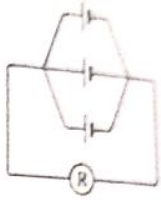
2

(A) 1. b 2. c 3. b 4. a 5. a

(B) $R = \frac{V}{I}$

$V = R \times I = 4 \times 1.5$

$= 6$ volt

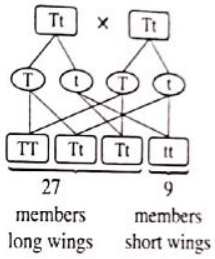


(C)

P

G

F



members long wings members short wings

3

(A) 1. (✗) 2. (✓) 3. (✓) 4. (✗) 5. (✓)

(B) 1. $Cu(OH)_2 \xrightarrow{\Delta} CuO + H_2O\uparrow$

2. $2HgO \xrightarrow{\Delta} 2Hg + O_2\uparrow$

(C) 1. $I = \frac{q}{t} = \frac{100}{20} = 5$ ampere

2. $V = \frac{W}{q}$

$V = \frac{1000}{100} = 10$ volt

$R = \frac{V}{I} = \frac{10}{5} = 2$ ohm

4

(A) 1. The dominant trait appears.

2. Increasing the number of collisions by increasing the temperature.

3. The rate of decomposition of hydrogen peroxide increases.

4. The current intensity in the conductor increases.

(B) 1. When the number of neutrons is more than the number required for its stability.

2. ***Look at the main book on pages*** **(163, 164 and 165).**

(C) 1. (A) : NaCl (B) : $NaNO_3$

2. Gas (D) : Oxygen gas, by approaching a burning match, the glowing of match increases.

3. AgCl –White ppt.

Additional questions

(A) 1. (✗) 2. (✗)

(B) 1. Catalytic converter. 2. Air bags.

5 El-Menofia Governorate

1

(A) 1. Chemical activity series. 2. Oxidation.

3. Electric potential of a conductor.

4. Electric resistance.

5. The chromosome. 6. Pea plant.

(B) 1. $NaCl + AgNO_3 \longrightarrow NaNO_3 + AgCl\downarrow$ (white ppt.)

2. $Na_2CO_3 + 2HCl \longrightarrow 2NaCl + H_2O + CO_2\uparrow$

(C) 1. The chemical reaction which results in a protein showing a specific hereditary trait will not occur.

2. This may lead to the damage of :

- Bone marrow.
- Spleen.
- Digestive system.
- Central nervous system.

2

(A) 1. Ohmmeter – Peaceful uses of nuclear energy.

2. Pressure – Ohm's law.

3. Produce direct current – Electric generators.

4. Attached ear lobe – Dominant traits in human.

(B) 1. ***Look at the main book on pages* (10 & 11).**

2. ***Look at the main book on page* (182).**

3. • **Ordinary rice :** It doesn't contain pro-vitamin (A).

• **Genetically Modified rice :** It contains pro-vitamin (A).

(C) 1. $V = 2 + 3 + 3 = 8$ volt.

$I = \frac{V}{R} = \frac{8}{2} = 4$ ampere.

2. $q = I \times t = 4 \times (2 \times 60) = 480$ coulomb

$W = V \times q = 8 \times 480 = 3840$ joule

3

(A) 1. d 2. b 3. a 4. a 5. c

(B) 1. It is used to control the current intensity and potential difference in the electric circuit.

2. It is used to reduce the electric potential.

3. ***Look at the main book on page (205).***

(C) 1. Simple substitution reaction

[A metal substitutes the hydrogen of acid]

2. The effect of surface area on the speed of a chemical reaction.

3. $Zn + 2HCl \xrightarrow{dil.} ZnCl_2 + H_2\uparrow$

4

(A) 1. $4NO_2$

2. Sulphur trioxide (SO_3)

3. Genes. 4. Iron rust

(B) 1. It is the breaking up of bonds in molecules of the reactants and formation of new bonds in the molecules of resultants (products) from the reaction.

2. It is the spontaneous decay of the atoms' nuclei of some radioactive elements that are present in nature in an attempt to achieve a more stable composition.

(C) 1. Because aluminium comes before hydrogen in C.A.S. , so it replaces hydrogen of diluted acids.

$2Al + 6HCl \xrightarrow{dil.} 2AlCl_3 + 3H_2\uparrow$

2. Because the low temperature in the fridge slows down the speed of chemical reactions done by bacteria which cause the rot of food.

3. Because the trait of green pods dominates over the trait of yellow pods in the pea plant according to the principle of complete dominance.

Additional questions

1. c 2. d 3. a